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Volume of Sales Expands Slowly

Railroads Expected To Come Into Market Soon—Chesapeake & Ohio Authorizes Equipment Purchases—Pig Iron Prices Firmer and Sales Larger—Mill Operations at Slightly Higher Level

IMPROVEMENT in the demand for steel is perceptible but the rate of recovery is below expectations. Uncertainty as to prices is retarding the buying of finished steel and while a few large users are beginning to purchase for stock, the majority of consumers are not yet convinced that the low point in prices has been touched.

One encouraging factor is that the railroads, especially those serving the Northwest and which have suffered from a depression of several years standing, are expected to come into the market for cars and track material as a result of advances in grain and live stock quotations. Weight is given to this expectation by reports that railroad rolling stock is not in a state of repair that will enable the carriers to handle the increased traffic of the winter months efficiently.

Mill operations continue to hold up well. Ingot production in the Chicago district slipped back a point, but in the Mahoning and Shenango valleys independent and Steel corporation steel works are operating at 64 per cent of capacity. Independent sheet mills in the valley have 68 per cent of capacity active, while tube mills are running at about 70 per cent.

Work Is Held Up

While little is heard in market circles of the effect of the complicated political situation on iron and steel business, it is known that the decisions on a number of important projects have been held up pending a more definite size-up of the outcome of the election.

No marked change in finished steel prices has taken place during the week, although instability is noted on certain products. The prospect of heavier demand in the Chicago district is encouraging. The Illinois Central is reported as being ready to inquire for 6400 cars of mixed classification. The directors of the Chesapeake & Ohio Tuesday authorized the purchase of 10,000 tons of rails and 2000 hopper cars for early delivery. The Baltimore & Ohio is asking for bids on 80 suburban coaches for Staten Island use and the Rapid Transit Construction Co. wants 150 cars. The few contracts placed during the week involve several hundred underframes and repairs to 700 refrigerator cars. Railroads are said to be figuring on their 1925 requirements.

Structural awards in July totaled 182,000 tons or about 70 per cent of capacity, a gain of 10,400 tons over the June total. During the past week activity in the shape market has centered in Chicago, the volume of inquiries and awards in other centers having fallen off appreciably. The tonnage represented in awards reported for all districts again is lower than that of the preceding week.

Ferro Prices Cut

Sharp reductions in English and domestic ferromanganese have failed to stimulate much business. Domestic material has been quoted as low as $92.50, tidewater, to eastern consumers, while in Pittsburgh the price structure is reported as so uncertain that it is difficult to make a quotation representative of the market. English sellers have reduced their quotations from $100 to $95, tidewater. Spiegeleisen also is being shaded, the domestic material now holding at about $33.

Under the influence of firmer pig iron prices, substantial sales, including iron for fourth quarter, are being made. Purchases in the Pittsburgh market aggregated about 20,000 tons, largely foundry iron. No. 2 iron now is quoted at $19.00 to $19.50, valley. Foundry iron in the East has gone to about $20.50, furnace. Sales by New York dealers last week aggregated about 20,000 tons and business handled from Philadelphia involved heavy tonnage. A Cleveland producer closed for from 25,000 to 30,000 tons during the week. Prices are firm in all markets, including the South, where the upward tendency was last to be felt.

IRON TRADE REVIEW composite again shows a slight gain, the figure being $39.37 as compared with $39.31 last week and $39.29 Aug. 6.

Government statistics show that in July the payrolls of the metalworking industries, including the iron, steel, machine tool, agricultural implement and foundry groups, decreased 9.5 per cent. Employment in the iron and steel industry dropped 5.6 per cent.

British Exports Gain

British exports of iron and steel in July were 347,799 tons, an increase from 324,432 tons in June. Imports were 247,154 tons compared with 175,476 tons in June. Germany's iron and steel exports for the first half of 1924 were 749,487 tons, a loss of over 200,000 tons from the corresponding figure in 1923.

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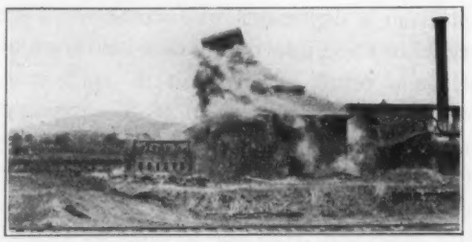
An Industrial District Surveyed

ABOUT St. Louis, but for readers everywhere. This conveys an idea of the scope of the St. Louis number of Iron Trade Review. Nine articles in this issue describe the business and industrial position of St. Louis and environs, in a manner and with thoroughness never before undertaken by a leading trade publication. The purpose has



Dismantling Old Stacks By Blasting. Page 484.

been to make a survey of an important industrial district, and to present all the basic facts, irrespective of their being to the advantage or disadvantage of that district. The business, trade and technical knowledge of nine experts in their respective fields is represented to that end in the 23 pages of editorial matter devoted to the survey. Much has been said recently about the possibilities of St. Louis becoming a greater steel and manufacturing center. St. Louis' prospects, and what it has to offer are set forth conclusively in this issue.

Cross Sections of Industry

"Approximately 80 per cent of iron and steel plants operate their own electric power plants."—*From* IRON TRADE REVIEW'S *survey, "Cranes".*

Pig Iron Prices Continue To Show Upward Tendency—Good Sales at Higher Levels Feature Market

PITTSBURGH, Aug. 19.—Asking prices for foundry iron have been marked up 50 cents to $1 by certain producers. One merchant interest which recently became strongly intrenched with orders for the third and last quarter named $20, valley, last week as its minimum. The move in this direction was followed by two other producers. Some sales of No. 2 foundry iron, ranging from 50 to 300 tons have since been made at $20, valley. These have tended to strengthen the position of furnaces with iron still available for the market. About 10 days ago a middleman in this district purchased 5000 tons at $19, valley, the seller agreeing to pile the iron for a short period pending shipping instructions. Later a maker of sanitary ware purchased 12,000 tons at $19 valley, this price having been quoted a week or two previous to the increase. The volume of foundry tonnage placed in the past few days was due to the expiration of options in the face of an advancing market. Some producers quoted $19 on tonnage a week or two ago, but consumers delayed closing. Sales during the past week here are conservatively estimated at 20,000 tons. With a valley maker still willing to take tonnages of No. 2 foundry iron at $19 to $19.50, and with certain sellers in this district asking $20, valley, the going market for this grade ranges from $19 to $20, valley, and $20, Johnstown. The market is leaning toward the maximum figure. A radiator company is understood to have purchased 1000 tons of No. 2 foundry iron at $19, although it cannot be learned whether this price was on a valley basis. A consumer which was in the market for 500 tons of No. 2 iron and 250 tons of higher silicon iron has not closed. The 1000-ton lot of No. 2 foundry iron which was under requirement by a northern Pennsylvania melter also is understood to be still pending. The strength of prices on this grade is attributed largely to the fact that several merchant producers who had to meet interest charges on ore purchases and outstanding bonds, by selling iron below cost of production, now are out of this difficulty.

If further tonnages are sold at $19, which merchant producers maintain is below cost, it will require blowing in furnaces. A pipemaker which has been seeking quotations on 2500 tons of gray forge is understood to have closed. Producers here are holding this grade at $19.50, valley, and $20, Johnstown. A Pittsburgh district sheetmaker who last week was endeavoring to line up 12,000 tons of basic iron closed for September requirements of 3000 tons with a steelworks furnace in close proximity to its plant. An eastern Ohio foundry recently closed for 3500 tons of basic at a price reported slightly below $19, valley. This figure, however, could not be verified. Low phosphorus iron is quotable at $27.50 to $28.50, with little tonnage in demand.

Buying For Fourth Quarter

Boston, Aug. 19.—New England foundries have taken an active interest in fourth quarter pig iron and recent sales for that delivery total close to 5000 tons. A Rhode Island consumer bought 1000 tons of No. 1X iron and several smaller lots and is understood to be still in the market. Several stove manufacturers have placed moderate tonnages for delivery after September. Several general foundries in Connecticut are in the market. Prices from all producing districts are firmer. One of the leading Buffalo furnaces has advanced its price to $19.50 for the base grade, $20.00 for No. 2X iron, (2.25 to 2.75 silicon), and $20.50 for No. 1X iron, (2.75 to 3.25 silicon). A Worcester, Mass., foundry bought 600 tons part malleable and part No. 2X, at a reported price of $19.00 Buffalo or $23.91 delivered. For usual lots $19.50, Buffalo, is bottom. One or two furnaces, however, are still willing to take desirable tonnage at $19. In eastern Pennsylvania at least one furnace is still quoting $20 although most of the tonnage placed during the past week has been at $20.25 or $20.50. A strong tendency to maintain full differentials is apparent and one eastern Pennsylvania furnace is holding to $1 between the No. 2X and No. 1X grades.

Good Sales in East

New York, Aug. 19.—Following the placing of approximately 20,000 tons of pig iron during the past week, new inquiry probably does not aggregate more than 10,000 tons. Probably the largest new inquiry is that of the New York Airbrake Co., involving 4500 tons, of which 2000 tons are No. 2 foundry and 1500 tons malleable. This business calls for delivery at the rate of three cars per day, commencing with September. A leading price development is an advance of 50 cents per ton by a Buffalo furnace to $19.50 base. At the same time, it appears that ordinary foundry iron in the east is virtually unattainable at under $20.50 furnace. At least this price more nearly represents the market than in some time. One lot of 5000 tons was purchased by Richardson & Boynton. The total also is understood to have included 3000 tons for the General Fire Extinguisher Co., Providence, R. I. A recent sale included 200 tons of high-silicon iron for prompt shipment for a northern New Jersey manufacturer. The New York Central railroad has come into the market for 350 tons of No. 1X, 2X and 3X, for delivery over the balance of the year. The Lackawanna is in the market for a small tonnage. An inquiry for 2000 tons of foundry iron has just come out from an unidentified consumer. Actual buying of malleable and basic iron in the local district has been small.

Demand Increasing

Buffalo, Aug. 19.—Pig iron demand is improving. Inquiry is for 15,000 to 18,000 tons. Sales of the district makers last week were between 25,000 to 30,000 tons. If new business continues to be placed at present rate production will be increased in the near future, makers say. Several sellers are cutting heavily into their stocks but are awaiting a real test of the market's strength before increasing output. New inquiry includes one lot of 3500 tons from a maker of railway equipment, 3000 tons of malleable and 1000 and 1300 tons of foundry grades. Scarcity of high silicon grades is developing in this district and prices have been advanced 50 cents to $1 a ton. One seller quotes $21 on the 2.75 to 3.25 per cent silicon grade and $21.50 on iron of more than 3.25 per cent silicon. It is possible to shade these prices 50 cents a ton in some instances, it is reported. Prices of the lower silicon grades are unchanged at $19 and $19.50. Basic and malleable are offered at $19, base.

Prices Are Higher

Cleveland, Aug. 18.—Pig iron prices are definitely 50 cents higher than a week ago, accompanied by a normal increase in the volume of business booked. Most of the companies represented in the northern Ohio group with headquarters here now are on a

$19.50, furnace, basis, for business outside of this territory. In Cleveland, $20, furnace, still prevails, although some effort is being made to obtain $20.50. Fair size sales have been made at $19.50 by valley, Buffalo, and lake furnaces. One of the leading merchant interests that has been selling heavily in the last week has advanced its price to $20, with regular differentials, and some buyers are closing at the higher figure. A price of $19.50, furnace, applied on 1000 tons of malleable, and a similar price was done on 1000 tons of low silicon malleable, booked for northern Ohio users. Three sales aggregating 2000 tons for delivery in Cleveland are tons of basic with nearby makers, having a 38-cent freight rate, at $20, furnace.

The McKinney Steel Co. has blown in one of its furnaces at Cleveland, three out of four of its Cleveland stacks now being in operation.

Eastern Prices Firmer

Philadelphia, Aug. 19.—Removal of several large tonnages last week has left the pig iron market rather quiet. Several fair orders, recently were placed, however, and several new inquiries ranging from 200 to 300 tons have come out, and in a few instances larger ones. Prices are firmer, but otherwise virtually unchanged. Ordinary foundry iron is quoted at $20.50 low phosphorus iron is comprised of small orders at recent prices.

Sentiment Stronger

Chicago, Aug. 19.—Northern pig iron sales are fair, mostly lots of 500 tons or less. If the rate in the first half of the month is maintained, August bookings will exceed July's. Many foundries have covered only partially for last half needs, and if foundry operations increase only to a fair degree, decidedly heavier buying will be mandatory. Northern foundry and malleable are firm at $20.50 furnace, with some sellers talking of an advance of 50 cents. The southern minimum is claimed to be $18, Birmingham. Business at $17.50 is reported refused. A Chicago melter is inquiring for 500 tons of low phosphorous iron. One quotation is $27.50, Sharon. A small tonnage of off analysis low phosphorous was sold in Milwaukee at $28, delivered. A sale of 150 tons of charcoal iron is noted. A quotation of $26, furnace, is lowest.

Prices Present and Past

Representative market figures yesterday, and for last month, three months ago and one year ago

	Aug. 20, 1924	July, 1924	May, 1924	Aug., 1923
PIG IRON				
Bessemer valley del., Pitts....	$21.76	21.66	24.06	28.07
Basic, valley	19.00	19.00	20.70	25.00
Basic, eastern del., eastern Pa.	20.00	20.50	20.75	25.10
*No. 2 foundry, del. Pitts.....	21.26	20.76	22.66	26.47
No. 2 foundry, Chicago	20.50	19.80	22.80	27.10
*Southern No. 2, Birmingham..	18.00	18.20	21.65	23.60
*Southern Ohio, No. 2, Ironton	20.00	19.40	22.50	26.00
**No. 2X, Virginia furnace....	24.50	24.50	25.50	26.25
**No. 2X, eastern, del. Phila....	21.76	21.76	22.60	25.81
Malleable, valley	19.00	19.00	21.30	24.70
Malleable, Chicago	20.50	19.80	22.80	27.10
Lake Superior charcoal, Chicago	29.04	29.04	29.04	32.10
Gray forge, val., del. Pittsburgh	20.76	20.26	23.26	26.27
Ferromanganese, del., Pitts....	103.79	110.79	112.29	122.29
SEMIFINISHED MATERIAL				
Sheet bars, bessemer, Pittsburgh	38.00	39.20	40.60	42.50
Sheet bars, open-hearth, Pitts....	38.00	39.20	40.60	42.50
Billets, bessemer, Pittsburgh....	38.00	38.00	39.20	42.50
Billets, open-hearth, Pittsburgh..	38.00	38.00	39.20	42.50
FINISHED MATERIAL				
Steel bars, Pittsburgh	2.15	2.15	2.25	2.40
Steel bars, Chicago	2.10	2.21	2.35	2.50
Steel bars, Philadelphia.....	2.47	2.47	2.57	2.72

	Aug. 20, 1924	July, 1924	May, 1924	Aug., 1923
FINISHED MATERIAL (Continued)				
Iron bars, Philadelphia	$2.42	2.42	2.47	2.72
Iron bars, Chicago mill.....	2.15	2.20	2.28	2.48
Beams, Pittsburgh	2.00	2.15	2.25	2.50
Beams, Philadelphia	2.32	2.37	2.42	2.82
Beams, Chicago	2.15	2.25	2.45	2.60
Tank plates, Pittsburgh.....	2.00	2.10	2.25	2.50
Tank plates, Philadelphia	2.07	2.17	2.42	2.82
Tank plates, Chicago	2.10	2.25	2.45	2.60
Sheets, blk., No. 28 Pittsburgh	3.50	3.60	3.65	3.85
Sheets, blue anl., No. 10, Pitts.	2.70	2.75	2.80	3.00
Sheets, galv., No. 28, Pittsburgh	4.60	4.70	4.80	5.00
Wire nails, Pittsburgh	2.80	2.85	2.95	3.00
COKE				
Connellsville furnace, ovens.....	3.00	2.85	3.35	4.45
Connellsville foundry, ovens	4.00	4.05	4.30	5.20
OLD MATERIAL				
Heavy melting steel, Pittsburgh.	17.50	17.30	15.40	17.50
Heavy melting steel, eastern Pa.	16.50	15.60	14.70	16.00
Heavy melting steel, Chicago..	15.50	14.75	13.75	16.25
No. 1 wrought, eastern Pa.....	18.75	18.05	17.75	17.50
No. 1 wrought, Chicago	15.75	14.80	13.60	17.05
Rails for rolling, Chicago	16.00	15.50	15.30	17.75

*1.75 to 2.25 silicon. **2.25 to 2.75 silicon.

Composite Market Average

Representing the Combined Average Prices Per Ton of Fourteen Leading Iron and Steel Products Yesterday, One Week, One Month, Three Months, One Year and Ten Years Ago.

Aug. 20, 1924	Aug. 13, 1924	July, 1924	May, 1924	Aug., 1923	Aug., 1914
$39.37	$39.31	$39.78	$41.38	$44.87	$22.72

Products Included Are Pig Iron, Billets, Slabs, Sheet Bars, Wire Rods, Steel Bars, Plates, Structural Shapes, Black, Galvanized and Blue Annealed Sheets, Tin Plate, Wire Nails and Black Pipe

noted at $20, local furnace, or $20.50, delivered. The price of $19, valley, has not entirely disappeared, as dealers report some sales at that figure during the past week. The leading producer closed for 25,000 to 30,000 tons of iron of all grades from its various furnaces during the week. Many of the slower buyers are coming into the market for their third quarter needs, while some sales also have been made into the fourth quarter. Two inquiries from eastern territory total 9000 tons; a Michigan inquiry is pending for 2000 tons; two 1000-ton inquiries are out from the Erie district. The American Steel Foundries closed during the week for 3000 tons of basic iron for Alliance, O., at a reported furnace price of $19. Follansbee Bros. Co. is reported to have closed part of an inquiry for 12,000 but $20 still can be done. Included in recent orders is 1000 tons for J. L. Mott, distributed to three sellers. The American Bridge Co., recently inquiring for 5000 to 10,000 tons, is understood to have withdrawn from the local market with the probability of the business being placed with a western seller. It develops the greater bulk of approximately 25,000 tons of basic bought recently was domestic iron. It is understood that not over 5000 tons, and possibly less, was Indian iron. R. D. Wood has not closed on 5000 to 10,000 tons inquired for. It is understood action may be deferred four to five weeks. Basic still is obtainable at $20, delivered, although some comparatively small sales of what is believed to have been copper-free basic, and noted last week as going at $20, furnace, have added a stronger aspect. Virginia foundry iron continues $24, furnace. Business in

Market is Higher

Cincinnati, Aug. 18.—Disappearance of the $19.50 Ironton base price for northern iron and the establishment of the market on a $20 furnace basis, was the outstanding feature of the pig iron situation here during the past week. Sales in the past week aggregated close to 8000 tons of northern and southern iron. The Standard Sanitary Co., bought 2,000 tons of northern foundry

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Iron and Steel Prices

SCRAP PRICES, PAGE 502; WAREHOUSE, PAGE 498; ORE, NUTS, BOLTS AND RIVETS AND PIPE PRICES, PAGE 504

Pig Iron

Prices per gross ton

Bessemer valley	$20.00
Bessemer, Pittsburgh	21.76
Basic, valley	19.00
Basic, Pittsburgh	20.76
Basic, Buffalo	19.00
Basic, del., eastern Pa.	20.00
Malleable, valley	19.00
Malleable, Pittsburgh	20.76
Malleable, Cleveland, del.	20.50
Malleable, Chicago	20.50
Malleable, Buffalo	19.00
Malleable, del., eastern Pa.	21.25 to 22.25

FOUNDRY IRON SILICON

No. 2 Northern	1.75 to 2.25
No. 2 Southern foundry	1.75 to 2.25
No. 2X Eas'n and Virgina	2.25 to 2.75
No. 1X Eastern	2.75 to 3.25
No. 1 Chicago	2.25 to 2.75
No. 2 foundry Eastern	1.75 to 2.25

No. 1X, eastern del., Phila.	21.76 to 22.76
No. 1X, Buffalo	20.00 to 20.50
No. 1 foundry, Chicago	21.00
No. 2 foundry, valley	19.50 to 20.00
No. 2 foundry, Pittsburgh	21.26 to 21.76
No. 2 foundry, Buffalo	19.00
No. 2 foundry, Chicago	20.50
No. 2 foundry, Granite City	21.50 to 22.00
No. 2 foundry, Ironton fur.	20.00
No. 2 foundry, Cleveland, del.	20.50
No. 2 foundry, del., Phila.	20.76 to 21.76
No. 2 foundry, N. J. tidewater	21.39 to 22.39
No. 2X, eastern del., Phila.	21.26 to 22.26
No. 2X, east. N. J. tidewater	21.89 to 22.89
No. 2X, eastern del., Boston	24.15 to 24.65
No. 2X, foundry, Buffalo fur.	19.00 to 20.00
No. 2X, Buffalo, del. Boston	23.91 to 24.91
No. 2 southern, Birmingham	18.00 to 18.50
No. 2 southern, Cincinnati	21.55 to 22.55
No. 2 southern, Philadelphia	25.80 to 26.30
No. 2 southern, Chicago	24.01 to 24.51
No. 2 southern, Cleveland	24.01 to 24.51
No. 2 southern, Boston (rail and water)	24.91 to 25.41
No. 2 southern, St. Louis	23.17 to 23.67
No. 2X, Virginia furnace	24.50
No. 2X, Virginia, Phila.	29.17
No. 2X, Virginia, Jersey City	30.04
No. 2X, Virginia, Boston	30.41
Gray forge, eastern Pa.	20.50 to 21.50
Gray forge, val. del., Pitts.	20.76 to 21.76
Low phos., standard, valley	27.50 to 28.50
Low phos., standard, Phila.	nominal
Low phos., Lebanon, furnace	24.00 to 24.50
†Low phos., English, Phila.	nominal
Charcoal, Birmingham	30.00 to 31.00
Charcoal, Superior, Chicago	29.04

Silvery Iron
Jackson County, Ohio, furnace

7 to 8 per cent	29.00
8 to 9 per cent	30.50
9 to 10 per cent	32.50
10 to 11 per cent	34.50
11 to 12 per cent	37.00
12 per cent	39.50

Bessemer Ferrosilicon
Jackson County, Ohio, furnace

10 to 11 per cent	39.50
11 to 12 per cent	42.00
12 to 13 per cent	44.50

Ferroalloys

†Ferromanganese 78 to 82 per cent, tidewater, or furnace first hand and resale	$92.50 to 95.00
Ferromanganese delivered Pittsburgh	$99.79
Spiegeleisen 19 to 21 per cent domestic furnace or tidewater	33.00
†Spiegeleisen, English, delivered tidewater	nominal
Ferrosilicon, 50 per cent contract freight allowed	70.00 to 75.00
Ferrotungsten standard, cents per pound contained	88.00 to 90.00
Ferrochrome, 60 to 70 chromium, 6 to 8 carbon, cents per pound contained, delivered	10.00 to 10.25
Ferrovanadium, 30 to 40 per cent per pound estimated, according to analysis	$3.25 to $3.60
Ferro carbon-titanium, carloads, producer's plant, per net ton	$200.00

†Duty paid.

Coke

Beehive, Ovens

Prices per net ton

Connellsville furnace	$3.00
Connellsville foundry	4.00 to 4.50
New river foundry	8.50 to 9.00
Wise county furnace	3.75 to 4.50
Wise county foundry	4.50 to 5.00
Alabama furnace	4.50 to 5.00
Alabama foundry	4.50 to 5.50

By-Product

Foundry, Newark, N. J., del.	$10.41
Foundry, Chicago, ovens	10.75
Foundry, Boston, delivered	11.50
Foundry, St. Louis	11.00
Foundry, Granite City, Ill.	9.00
Foundry, Alabama	4.50 to 5.50

Semifinished Material

Prices per gross ton

BILLETS AND BLOOMS

4 x 4-inch base

Open-hearth, Pittsburgh	$38.00
Open-hearth, Youngstown	37.50
Open-hearth, Philadelphia	42.17 to 43.17
Open-hearth, Chicago	34.00 to 38.00
Bessemer, Pittsburgh	38.00
Bessemer, Youngstown	37.50
Forging, Pittsburgh	42.00 to 43.00
Forging, Philadelphia	45.17 to 48.17

SHEET BAR

Open-hearth, Pittsburgh	38.00
Open-hearth, Youngstown	37.50
Bessemer, Pittsburgh	38.00 to 40.00
Bessemer, Youngstown	38.00 to 40.00

SLABS

Pittsburgh	38.00
Youngstown	37.50

WIRE RODS

¼-inch and finer

Wire rods, Pittsburgh	$46.00

Standard extras, $2.50 per ton over ¼-inch; $5 for screw stock; $15 for acid wire rods. Carbon extras, $3 for 0.20 to 0.40; $5 for 0.41 to 0.55; $7.50 for 0.56 to 0.75; $10 over 0.75.

SKELP

Grooved skelp, Pittsburgh	2.00c to 2.15c
Universal skelp, Pittsburgh	2.00c to 2.15c
Sheared skelp, Pittsburgh	2.00c to 2.15c

Shapes, Plates and Bars

Prices per pound

Structural shapes, Pittsburgh	2.00c to 2.10c
Structural shapes, Phila.	2.22c to 2.47c
Structural shapes, New York	2.24c to 2.49c
Structural shapes, Chicago	2.15c
Structural shapes, Birmingham	2.25c to 2.30c
Tank plates, Pittsburgh	2.00c
Tank plates, Philadelphia	2.02c to 2.22c
Tank plates, New York	2.04c to 2.24c
Tank plates, Chicago	2.10c to 2.15c
Tank plates, Birmingham	2.15c to 2.25c
Bars, soft steel, Pittsburgh	2.15c
Bars for cold finishing, Pitts.	2.25c to 2.30c
Bars, soft steel, Philadelphia	2.47c
Bars, soft steel New York	2.49c
Bars, soft steel, Chicago	2.10c to 2.15c
Bars, soft steel, Birmingham	2.25c to 2.30c
Bars, refined iron, Pittsburgh	3.00c to 4.75c
Bars, rail steel, Chicago	2.03c to 2.13c
Bars, rail steel, mill	2.10c to 2.20c
Reinforcing bars, billet, Pitts.	2.10c to 2.15c
Bar iron, common, Phila.	2.42c
Bar iron, common, New York	2.44c
Bar iron, common, Chicago	2.15c
Bars, forging quality, Pitts.	2.35c to 2.40c

Hoops, Bands, Strip

Prices per pound

Hoops, Pittsburgh, under 5 in.	2.60c
Hoops, Pittsburgh, 20 gage, under 1 in.	2.90c to 3.00c
Bands, Pittsburgh	2.50c to 2.60c
Hot rolled strip steel, Pittsburgh stamping quality	2.50c
Cold rolled strip steel, hard coils, 1½ inches and wider by 0.100-inch and heavier, base, Pittsburgh	4.25c

Cold Finished Steel

Prices per pound

Cold finished steel bars, drawn or rolled Pittsburgh and Chicago, carloads	2.80c
Cold-finished steel bars, drawn or rolled Pittsburgh and Chicago, less carloads	3.05c
Steel shafting, turned and polished Pittsburgh and Chicago	2.80c

Rails, Track Material

Standard bessemer rails, mill	$43.00
Standard open-hearth rails, mill	43.00
Relaying rails, St. Louis	27.00 to 32.50
Relaying rails, Pittsburgh	25.00 to 28.00
Light rails, 25 to 45, mill	1.90c to 2.00c
Angle bars, Chicago base	2.75c
*Spikes, railroad, Pitts.	2.75c to 2.80c
*Spikes, small railroad, 7/16-in. and smaller	3.25c
Spikes, boat and barge, Pitts.	3.25c
Spikes, railroad, Chicago	2.80c to 3.00c
Track bolts, Pitts. standard	3.75c to 4.00c
Track bolts, Pitts., small	4.50c to 4.75c
Track bolts, Chicago	3.80c to 4.00c
Tie plates, Pittsburgh	2.50c to 2.55c
Tie plates, Chicago	2.45c

Spike, tie plate and truck bolt prices for carlots.

*New list.

Wire Products

To Jobbers in Carloads

Prices per pound

Wire nails, Pittsburgh	2.80c to 2.85c
Galv'd nails, 1-inch and over	5.10c
Plain wire, Pittsburgh	2.55c to 2.60c
Annealed wire, Pittsburgh	2.75c
Galvanized wire, No. 9 gage, Pittsburgh	3.20c
Barbed wire, painted, Pitts.	3.20c
Barbed wire galv., Pitts.	3.55c
Polished staples, Pittsburgh	3.30c
Galvanized staples, Pittsburgh	3.55c
Coated nails, count keg, Pitts.	2.25c
Woven wire fencing (retailers) 12½ gage, 26-in. high 7 bars and 12-in stays per 100 rods, f.o.b. Pitts.	$20.03
Spring wire	3.70c

Sheets

SHEET MILL BLACK

Prices per pound

No. 28, open-hearth, Pitts.	3.50c
No. 28, bessemer, Pitts.	3.50c
No. 28, open-hearth, Phila.	3.72c to 3.82c
No. 28, open-hearth, Chicago	3.84c to 3.99c

TIN MILL BLACK

No. 28, open-hearth, Pitts.	3.50c

GALVANIZED

No. 28, open-hearth, Pitts.	4.60c
No. 28 besemer, Pittsburgh	4.60c
No. 28, open-hearth, Phila.	4.92c to 5.02c
No. 28, open-hearth, Chicago	4.94c to 5.04c

BLUE ANNEALED

No. 10, open-hearth, Pitts.	2.70c
No. 10, bessemer, Pittsburgh	2.70c
No. 10, open-hearth, Phila.	3.02c to 3.12c
No. 10 open-hearth, Chicago	3.04c to 3.14c

AUTOMOBILE SHEETS

No. 22, Pittsburgh	4.75c

Tin Plate

Prices per 100-pound box

Tin plate, coke base, Pitts.	$5.50

Iron and Steel Pipe

Base Discounts Pittsburgh to Jobbers in Carloads

	Black	Galv.
1 to 3-inch, butt steel	62	50½
1 to 1½-inch, butt iron	30	13

Boiler Tubes

Less Carload Discounts—Carloads 4 Points Additional

Steel 3¼ to 3¾-inch	38½
Charcoal iron, 3¼ to 4½-inch	5
Seamless hot rolled, 3½ to 3¾-inch	35

Chain, Piling, Cut Nails

Prices per pound

Chain, 1-in. proof coil, Pitts.	6.25c
Sheet piling base, Pittsburgh	2.05c to 2.15c
Cut nails, Pittsburgh	2.90c

Cast Iron Water Pipe

Prices per net ton

Class B Pipe

Four-inch, Chicago	$56.20 to 57.20
Six-inch and over, Chicago	52.20 to 53.20
Four-inch, Birmingham	51.00 to 52.00
Six-inch and over Birm'ham	47.00 to 48.00
Four-inch, New York	64.50 to 65.60
Six-inch and over, New York	59.50 to 60.60
Standard fittings, Birmingham, base	$110.00

6 to 24-inch, base; over 24- inch, plus $20; 4-inch, plus $20; 3-inch, plus $20; gas pipe fittings, $5 higher.

Class A pipe is $5 higher than Class B.

Steel Scrap More Active

Heavy Melting Grades Show Increase in Prices in Some Localities—Iron Scrap Sluggish—Dealers Continue To Stock Supplies

SCRAP PRICES, PAGE 502

Chicago, Aug. 19.—Scrap iron and steel dealers generally are more bullish and the railroads are getting high prices for their scrap, yet melters continue aloof and bear down upon an otherwise boiling market. Brokers are doing little trading; yard dealers are slowly adding to their stocks in anticipation of an advance. That the melt of scrap in this district is on the increase is generally conceded. Largely on the strength of what the railroads have received for their offerings, many grades have advanced 25 cents a ton. In many instances melters would not pay the tops of the spreads, but that dealers would sell for less is improbable. A local car wheel foundry is credited with a purchase of 5000 tons of cast iron wheels. Angle bars are up 50 cents on the strength of a fair-sized deal. With dealers generally bullish, all that is needed to send the market up decidedly is fair consumer buying. Railroad offerings include 12,000 tons by the Louisville & Nashville, 10,000 by the Baltimore & Ohio, 3000 by the Rock Island and 1725 by the Grand Trunk.

Better Steel Demand

Boston, Aug. 19.—The scrap iron and steel market, while far from active, shows slightly more life than during the past two or three weeks. Heavy melting steel is in moderate demand from eastern Pennsylvania consumers and also from New England dealers for speculation purposes. This grade of scrap bought at $12.00 shipping point now can be placed in eastern Pennsylvania at a profit. Some speculative buying at as high as $12.50 shipping point has taken place during the week. Blast furnace scrap is firmer as shown by a sale of 200 tons of mixed borings and turnings at $8.75 shipping point. Borings for gas works have sold as high as $10.00 and steel mill turnings are in moderate demand at $8.75 to $9.00 shipping point. The cast grades are sluggish. One dealer reports a sale of 100 tons of textile scrap to a Connecticut consumer at $20.50 delivered.

Buying Takes Decided Spurt

Philadelphia, Aug. 19.—Scrap buying has taken a decided spurt, with fully 25,000 tons being placed in this district during the past week. The largest order involved 15,000 tons of heavy melting steel. Prices generally have advanced, with substantial sales of heavy melting going at $18, delivered eastern Pennsylvania. Should the Pittsburgh market reflect a corresponding strengthening, still higher prices would appear inevitable. Bundled sheets are turning higher, largely on buying for Phoenixville. Allan Wood Iron & Steel Co. recenty bought a sizeable tonnage at $17, delivered, from dealers.

Sell For Immediate Consumption

Pittsburgh, Aug. 19.—The tonnage of miscellaneous scrap, offered last week by the Norfolk & Western railroad, was purchased at prices well in line with those recently paid on the Pennsylvania Railroad Co.'s list. These were considered rather high in trade circles. While sales of miscellaneous grades of scrap are being made right along, the tonnage involved shows no marked increase over dealings conducted during the past two or three months. The majority of dealers in this district are purchasing heavy melting steel in such quantities as they are able to pick up, and, whenever a sale is made, the material usually passes direct to charging boxes. About the only buying being done by steelworks is when demurrage is about to apply on a few carloads of heavy melting steel, and the tonnage in this connection frequently is offered at $17.50. Dealers are asking $18 on this grade, however. While heavy breakable cast is quoted from $15 to $15.50, it requires considerable persuasion to enter an order at this figure. Railroad malleable continues quotable at from $16 to $16.50 and stove plate scrap from $14 to $14.50, although these figures largely are nominal in the current market.

Dealers Are Stocking Some Material

Buffalo, Aug. 19.—There is an active dealers' market for a number of scrap materials. Mills have placed good sized orders and are asking for heavy shipments. One Buffalo consumer will pay $17 for heavy melting steel but is grading critically and rejections are heavy. Some dealers are accepting another consumer's offer of $16 to $16.50 with grading less critical. Dealers inquiring as to a stock of 4000 to 5000 tons of heavy melting steel held by a broker were told the material was being held in anticipation of an early advance in Valley and Pittsburgh prices to $20 or $21. While these points are inquiring for Buffalo material, their offers figure less than local consumers will pay and the heavy shipment of scrap to outside consumers is being reduced materially. Dealers are stocking what material can be had at prices that seem advantageous. There is a good market for hydraulic compressed, sales at $16 to $16.50 being reported this week. Loose bundled sheets show less activity, with the price around $14. Stove plate is being sold in quantity around $16 to $16.50. Scrap dealers look for a fairly strong market throughout the month, improving toward the end of the quarter.

Demand for Scrap is Lacking

Detroit, Aug. 19.—A weaker tendency prevails in the scrap market. Blast furnace grades show a decline of 50 cents a ton, while some foundry grades also are weaker. Dealers declare there is no demand whatever for any grades at this time. Representatives of consumers who have canvassed the field the past week gave no indication when the mills

(*Concluded on Page* 461)

Semifinished Prices Soft

Valley Makers Selling Sheet Bars, Billets and Slabs at $37.50—Wire Rods Booked at $46—Markets Dull

SEMIFINISHED STEEL PRICES, PAGE 451

Pittsburgh, Aug. 19.—No inquiries for sheet bars, slabs or billets were received by district semifinished producers during the week just closed, and the quotation of $38, Pittsburgh continues untested. A fairly good run of specifications for sheet bars, and moderate specifications for slabs are being issued bp consumers who made mill connections earlier in the year. Specifications are coming out in better volume in the Youngstown district where the price of $37.50, Youngstown, is being applied on sales of sheet bars, billets and slabs. The wire rod market has swayed toward buyers' hands. While some makers a week ago were endeavoring to write business on their books at $48, base, they were obliged to give ground in the face of competitive quotations of $46. The market, however, continues quotable at a range of $46 to $48, depending upon the tonnage involved. No pick-up in the demand for skelp is apparent at the present writing, the market still commanding from 2.00c to 2.15c, base Pittsburgh.

Prices Are Untested

Cleveland, Aug. 19.—The market for semifinished material remains quiet, and prices are untested. Some off-grade billets have been sold at $35, mill, but this does not represent the market on standard product. Nominal prices of $38 are quoted on sheets bars, billets and slabs. Specifications are being issued in good volume.

Market Shows More Life

Philadelphia, Aug. 19.—Demand for forging billets is more active. Shading of the generally accepted market prices can still be done. One seller recently closed on 300 tons of forging billets and on 250 tons of another lot of 1000 tons inquired for. The total amount is expected to be closed soon. Forging billets are quoted $42 to $43, and rerolling billets are going at $38, with some makers shading the price $1.

Consumers Taking Sheet Bars

Youngstown, Aug. 19.—Some sheet bars are beginning to move from maker to consumer, this being considered a favorable trade sign. Most of these bars are moving on releases from the second quarter quota as yet undelivered because of previous sheet mill shutdowns. While new business is not important, suggestion is made of a split in the quotation between Pittsburgh where $38, mill, prevails and at Youngstown where as yet sales have not yet fully defined the third quarter market.

Report Price Under $35

Chicago, Aug. 19.—Under $35, Chicago, has been done by large buyers

of billets 4 x 4 and under, it is claimed, although $38 still is the price to small buyers. Some bargain or distress lots have gone lower than the present range of $34 to $38, according to report.

Ferromanganese

And Spiegeleisen Prices Cut But Reductions Fail to Stimulate Buying

FERROALLOY PRICES, PAGE 451

New York, Aug. 19.—Sharp reductions in ferromanganese feature the week in ferroalloys. English sellers lopped off their price $5 to a level of $95, tidewater, while domestic material has been quoted at $94, duty paid tidewater. So far as can be learned, the reductions have failed as yet to stimulate much new business.

Shading is also noted in spiegeleisen. The domestic market is now holding at around $33 furnace, on 19 to 21 per cent metal and $32 on 16 to 19 per cent. Foreign spiegeleisen is holding at around the same levels, based tidewater. While no large sales have been reported, it is known that domestic orders the past week have amounted close to 2000 tons.

Quotations on ferrosilicon are unchanged, the 50 per cent grade holding at $72.50 to $75, delivered, and the 14 to 16 per cent grade, $36 to $38 furnace. The situation in ferrochrome is featureless with demand routine.

Price Structure Wobbly

Pittsburgh, Aug. 19.—Ferromanganese at today's nominal price of $95, seaboard, is at the lowest level quoted in the last decade, taking into consideration the present cost of ore and duty. The price structure has been so wobbly during the week just closed that it is difficult to determine a quotation representative of the market. A week ago sales were being closed at $100, seaboard, on foreign material and at $99 for domestic, but since then $5 per ton has been clipped off the price of tonnage brought into this country. Approximately 2000 tons of English ferromanganese will be put on sale this week at Baltimore. Two carloads of 50 per cent ferrosilicon are record in this week's sales. While 19 to 21 per cent spiegeleisen is quotable from $33 to $35, and 16 to 19 per cent spiegel from $32 to $34, these figures purely are nominal. One producer recently entered a sale of 500 tons of the 19 to 21 per cent grade at $34, furnace. Consumers who contracted earlier in the year for spiegeleisen requirements are asking for shipments at a better rate. New business is lacking.

Increased Business Being Done

Philadelphia, Aug. 19.—Following a recent reduction in prices, substantial business has been booked in ferromanganese. One importer received 3000 tons during the first couple days since the cut but has booked little since. Most of the tonnage now being placed was under negotiation at the time of the reduction. Domestic maetrial recently was quoted as low as $92.50, tidewater. Sellers of foreign spiegeleisen are quoting $33, tidewater, with the leading domestic seller meeting this competition.

Coke Market Is Unsettled

Spot Furnace Fuel Still Available at $3—Makers Holding to $3.25 for Last Quarter Tonnages

COKE PRICES, PAGE 451

Pittsburgh, Aug. 19.—Not much change is apparent in the coke market, a policy of buying for immediate requirements continuing in effect. Slightly more interest is shown by customers in sounding out the market for last quarter requirements. So far as can be learned producers are in one accord as to fourth quarter contract prices, nothing lower than $3.25, ovens, being available at present. Miscellaneous orders for spot fuel are held down to a comparatively few car loads. Furnace coke for immediate shipment still is available at $3, ovens, with the supply still greater than current demand. Close observers of the coke market state the situation in this district is much better than found in two or three nearby localities. The market for medium sulphur coke continues to drag. Prices are not clearly defined. Some requirements recently were filled at $2.90 and lower, while some sellers are holding this grade at $3.

Production of coke for the week ended Aug. 9 was 46,320 tons, as compared with 51,260 tons the preceding week, according to the *Connellsville Courier*.

Sales Are Small

New York, Aug. 19.—Small buying again features the market for foundry coke. Prices are ranging from $4.25 to $5.25, ovens, depending upon the brands. Distress lots which recently were noted at around $4, have practically disappeared. The market on by-product foundry coke is holding at $10.41, delivered at Newark and other northern New Jersey points.

Market Is Stronger

Cincinnati, Aug. 19.—The coke market is stronger than a week ago. Demand has improved and there is a good movement of foundry and domestic coke. Consumers are showing more willingness to contract for fuel at present quotations. A leading seller reported a larger volume of domestic coke orders from dealers in the rural districts than for several weeks. The sale of 6000 tons of Indianapolis foundry coke to the Kokomo Steel & Wire Co., Kokomo, Ind., for shipment over the next 12 months was the outstanding transaction. New River and Wise county foundry coke hold the spotlight in the market. The Turkey-Knob Coal & Coke Co., in the New River district has put in operation 12 additional ovens, making a total of 25 ovens firing. The Flat Top Fuel Co., is the only operation functioning in the Pocahontas district. The company has a few ovens firing, to take care of some business it recently received from the Norfolk & Western railroad. Another encouraging market feature is the fact that users with contract are specifying more tonnage. The price situation is unchanged.

Buying Hand-to-Mouth

St. Louis, Aug. 18.—A general lack of interest on the part of consumers features the coke situation. Foundry coke is being purchased on a hand-to-mouth basis. This business is being handled almost exclusively by the by-product makers. Some storage by western and southwestern melters is noted but not in volume sufficient to affect the market. Prices are unchanged except for concessions granted to move small tonnages of coke on tracks.

Increases Operations

Chicago, Aug. 19.—A Milwaukee melter has placed 100 tons of by-product coke. Shipments are slightly better. Operations on the Milwaukee Coke & Gas Co. have been increased.

Production Further Curtailed

Birmingham, Ala., Aug. 18.—Coke production in Alabama is being cut in accordance with demand. More than 100 beehive ovens have been shut in this district recently, besides a number of by-product coke ovens. The iron and steel companies are also scheduling their coke production by immediate needs, except where there must be steady operation of by-product plants because of gas and by-product contracts.

Strip Steel Buying Better

STRIP PRICES, PAGE 451

Pittsburgh, Aug. 19.—Producers of strip steel in this district report business as being much better than a week ago. While orders are not assuming attractive proportion daily bookings over the past week have been sufficient to warrant a full operation of one or two hot strip mills in this district. The price largely depends upon the quantity of hot strip under requirement, ranging from 2.40c to 2.50c. While some makers of cold-rolled have been endeavoring to get 4.50c, they have had to lower their quotation to 4.25c to book business.

Hot Strip Buying Spotty

New York, Aug. 19.—Business in strip steel continues spotty, this being particularly noticeable in hot rolled material. Heavier gages can be had at as low as 2.40c, Pittsburgh, while the lighter narrower gages are holding around 2.50c, with at least one seller holding firmly to 2.60c. The situation in stock material is unsettled. Such transactions as come up are a matter of individual negotiation. Cold rolled material is going at around 4.25c, with little in the way of attractive business.

Better Volume Being Booked

Youngstown, Aug. 19.—A better volume of new business and releases on heldup orders for both hot and cold rolled strip steel is coming to valley mills from Detroit. One upper valley plant is operating this week at 100 per cent, including, of course, other lines of production. Quotations are steady at 4.25c, Pittsburgh, for cold-rolled and at 2.40c to 2.50c for hot strip.

Bar Market More Active

Buying for Stock Strengthens Situation at Chicago—More Tonnage Being Released and Prices Are Slightly Firmer

BAR PRICES, PAGE 451

Chicago, Aug. 19.—Buying for stock is the most encouraging phase of the soft steel bar market and good business from this source has resulted, according to producers. Consumers apparently are acquiring confidence and while prices still are unsettled, the feeling is becoming widespread that bottom is being plumbed. A local warehouse interest is credited with fair buying of bars. One interest has canvassed the market and come to the conclusion that those large users who have not yet restocked on bars will do so shortly. While some business is being taken above the spread of 2.10c to 2.15c, Chicago, that range describes the Chicago market.

Railroads are heavier inquirers for bar iron but have not yet translated this interest into orders. In the rail steel bar market the farm implement makers are the prospective sources of new business. Bookings in both grades are slightly better. Rail steel has sold for as low as 2c, mill, or 2.03c, Chicago. More and more bar iron business is being placed at 2.15c, Chicago.

Total Sales Increase

Boston, Aug. 19.—Sales of soft steel bars to date in August show a marked improvement over the same period in July. The leading interests hold firm at 2.15c, base Pittsburgh, but buyers still lack confidence in the firmness of this price and for the most part are buying from hand to mouth. Some sales at 2.10c base Pittsburgh are reported.

Market Firmer at 2.15c

New York, Aug. 19.—Although 2.10c may still be done on particularly desirable tonnages, the market on hot rolled bars is firmer at 2.15c, Pittsburgh. No large orders are reported, but the total volume is slightly better and sentiment, reflecting business conditions generally, is substantially improved.

Market Is Featureless

Philadelphia, Aug. 19.—Steel bar buying is featureless and trading is far from brisk. While most sellers are firm at 2.15c, Pittsburgh, 2.10c still is available. The generally accepted market on iron bars now is 2.10c. The rail market features an improved demand for rerolling material. A coal company in this district recently closed for 1000 tons, and new inquiry is the best in some time.

Firmness Prevails at Pittsburgh

Pittsburgh, Aug. 19.—Efforts of consumers to shade prices on soft steel bar requirements are not meeting with success. Producers are holding to 2.15c, base Pittsburgh. A carload was placed this week on this basis by a consumer who a few days ago asserted he had a mill connection willing to schedule his requirement below this figure. The general run of orders displays an increase in volume. Some makers are entering business in 250-ton lots from consumers whose buying policy recently has held down placements to 50 tons or less. Inquiry for low phosphorus melting bars continues scarce, the market price of which is considered $78.

Improvement Is Slight

Cleveland, Aug. 19.—Little change has occurred in the local bar market during the past week. The volume of sales again has indicated a faint improvement, and inquiry still is encouraging. More uncertainty, however, seems to characterize the action of automobile builders and parts makers, whose purchases thus far in August have not been up to the expectations expressed in July. Nut and bolt makers are showing more interest in the market, but the improved demand for nuts and bolts has not yet been sufficiently marked to noticeably affect the volume of bar purchases. The open price on steel bars still is 2.15c, Pittsburgh, but reports of lower prices on desirable business still are current.

More Tonnage Being Released

Pittsburgh, Aug. 19.—More attractive trading is reported by producers of cold finished bars. Tonnages specified during the week surpass those of a week ago and producers view the future with more encouragement. During the past 10 days business booked from the automotive industry shows an improvement. Releases of tonnage on order also have widened. A few consumers are anticipating future needs and makers expect some good tonnage before the close of this month. The market stands at 2.80c for carload quantities while smaller consignments continue to command 3.05c, base Pittsburgh. Ground shafting is quoted at 3.20c, base, mill.

Hoops and Bands Slow

HOOP PRICES, PAGE 451

Pittsburgh, Aug. 19.—Current transactions in the hoop and band market this past week show no signs of enlargement despite the fact that a much better feeling prevails. The market is competitive and strip makers in a position to roll hoop sizes and gages on their mills are taking tonnage at 2.60c. Bands continue to be quoted from 2.50c to 2.60c although the majority of the going business is being entered at the minimum figure.

Nuts, Bolts and Rivets Recovering Slowly

NUT AND BOLT PRICES, PAGE 504

Pittsburgh, Aug. 19.—A pick-up has been noticed in the volume of nut and rivet business placed with makers in this district. Large rivets continue quotable from 2.50c to 2.60c, with the lower figure encountered in one or two cases and the maximum representing the general market. Rivets 7/16-inch and smaller are quoted by some makers at 70, 10 and 5 off, while others are naming 70, 10 and 10 off the list price. Standard track bolts continue quotable from 3.75c to 4.00c although sales of this commodity have fallen off somewhat the past week. Buying interest from the railroads for standard bolts has not awakened to any marked extent and a substantial inquiry doubtlessly would be quoted generally at 3.75c.

Rivet Prices Firmly Held

Pittsburgh, Aug. 19.—Rivet makers now are holding firm at 2.60c, Pittsburgh, on large rivets and are quoting 70, 10 and 5 off, on small. Lower prices have been abandoned.

Prices Are Firmer

Cleveland, Aug. 19.—Bolt and nut prices are firmer. During the past 10 days demand has improved to such an extent that the extremely low prices, which have prevailed for some time past, have disappeared and the former market maximums now are minimum prices. Large bolts now are firmly quoted at 60 and 20 off. Most makers are not contracting and the current prices apply therefore only on spot business. Individual orders are not large, but total a good volume of business.

Little change in the rivet market is noted from a week ago. Demand continues fairly active compared with some time past but orders still are small. Prices are firm but the leading maker still is considering withdrawing from the market.

Buying Increasing, But Slowly

Chicago, Aug. 19.—Makers of bolts and nuts generally are receiving a slightly better run of orders from general sources, but improvement is coming slowly. Some farm implement manufacturers have bought a trifle more freely and decided improvement from this source is looked for in the near future, but with both the implement and the automobile trade lagging, bolt and nut business cannot increase appreciably. The price range still is 60 and 20 off to 70 off for large machine bolts.

Pig Iron Prices Firm

(*Concluded from Page* 450)

iron for its Louisville Ky., plant from the Marting Iron & Steel Co. for delivery over the remainder of this year. The United States Radiator Co., is reported to have closed for a like tonnage of southern iron for its Litchfield, Ill. plant, while the Williamson Heater Co., Cincinnati, bought 800 tons of northern iron and 600 tons of southern iron. The Globe Stove & Range Co., Kokomo, Ind., purchased 300 tons of northern iron from a furnace interest in the Ironton district for early delivery. Other sales include carload lots of northern, southern, silvery and charcoal irons. Reports are current that silvery irons are being shaded $1 a ton. Inquiries for the most part involve small tonnages. The Standard Sanitary Co., is in the market for its last quarter requirements of southern iron, which will aggregate between 10,000 and 15,000 tons. The southern Ohio market is firm at $20 Ironton base, while southern iron

ranges from $17.50 to $18.50 Birmingham, base.

Market Continues Dull

Birmingham, Ala., Aug. 18.—The Southern pig iron market continues dull. Quotations range from $17.50 to $18.50 per ton. For a while a little selling for delivery into the central and middle west territories gave encouragement, but the aggregate business this month has not been up to expectations. Another blast furnace will go out of commission this week. The local melt of iron is showing no improvement now. Advancing prices elsewhere indicate the possibility of more competition by southern iron.

Britain Retains Duties on Machine Tools

London, Aug. 19.—Although the so-called McKenna duties on automobiles, etc., have been abolished effective Aug. 1. the safeguarding of industries duties covering certain imports into Great Britain are still in effect. Therefore, machine tools, precision instruments, gages, tungsten vanadium, and other rare metals, and the complete list of chemicals scheduled under the safeguarding of industries act are still dutiable at 33 1/3 per cent ad valorem. The only articles on which the duties have been removed are automobiles, watches and clocks, musical instruments moving picture films and certain other minor articles.

For some time past British manufacturers have not been satisfied with the conditions of trade in Great Britain as well as in the various export markets. As a result the government has appointed a committee to inquire into a report upon conditions and prospects of British industry and commerce, with special reference to the export trade, and to make recommendations in regard thereto. Although the iron and steel indsutries are among those most interested in the results of this investigation few representatives of the trade are on the committee except, Sir Arthur Balfour, director of Arthur Balfour & Co., Ltd., manufacturers of high-speed and crucible steel, Sheffield, who is chairman of the committee. The secretary of the committee is Walter Carter of the board of trade, and the assistant secretaries are A. R. Fraser of the department of overseas trade and W. L. Buxton of the ministry of labor.

Operate at 45 Per Cent

Chicago, Aug. 19.—Steel ingot operations of one interest in this district have receded slightly while those of another have gained appreciably. The finishing operations of the latter interest are reported to be considerably higher than its ingot operations would indicate, as it is reducing its stock of semifinished material. For the district as a whole, ingot operations this week are 43 to 45 per cent. Nine of the steelworks blast furnaces of the two leading interests continue active.

Plate Improvement Noted

Bookings in Eastern Territory 30 Per Cent Better Than in July—Chicago Market Weak—Miscellaneous Tonnages Small

PLATE PRICES, PAGE 451

Philadelphia, Aug. 19.—The week's plate business included several lots of 500 tons or over. One inquiry for 1300 tons for locomotive repair work is about to be placed. Leading sellers state buying is fully 30 per cent over the rate in July. One interest lighted another furnace during the week. Sellers are moving more cautiously about booking future business, and one has turned down 2000 tons for fourth quarter, although expressing a willingness to give protection should prices advance. Present quotations range from 1.75c to 1.85c, Pittsburgh, with some sellers getting more on scattered lots.

Market Is Quiet

New York, Aug. 19.—The plate market again is devoid of sizable new inquiries. However, there has been a sprinkling of small orders, with one or two good tonnages pending from the preceding week. Prices on plates have shown relative steadiness for the past three weeks, the market still holding at 1.75c to 1.85c, Pittsburgh.

Quietness Is Unbroken

Pittsburgh, Aug. 19.—Purchasers of plates still are buying as various specifications are needed. Tonnage under placement is not of sufficient proportion to take the edge off the competitive situation which has ruled for several weeks. While some producers are quoting 2.10c, Pittsburgh, it is becoming increasingly difficult to line up tonnage at this figure in view of the market being quoted generally at 2.00c, Pittsburgh.

Resumption of Buying Slow

Cleveland, Aug. 19.—A few consumers of plates in this territory who for several months have been purchasing in less-than-carload lots now are buying by the carload. A slightly improved condition also seems to exist among other groups of plate consumers with the exception of the shipbuilding companies. However, the increase in local plate sales from week to week have been small. The price is around 2.00c, Pittsburgh.

Railroads Providing Business

Chicago, Aug. 19.—One local maker of plates has booked 1200 tons for oil storage tanks. The 3500 tons of finished material, mostly plates, in 200 general service tank cars to be built by the General-American Tank Car Corp. and 250 refrigerator car bodies to be built by the Western Steel Car & Foundry Co. has been placed here. One plate-making interest expects to get considerable tonnage out of the 1000 hopper car order which the Chesapeake & Ohio railroad is about to place, and several thousand tons for the Missouri Pacific refrigerator cars which were let last week. The plate quotation is weak, with less than 2.00c, Chicago, having been done in highly competitive territory but 2.10c to 2.15c, Chicago, more representative in the Chicago district proper.

Tin Plate Demand

Is Fairly Satisfactory—Canmakers To Place Large Orders

TIN PLATE PRICES, PAGE 451

Pittsburgh, Aug. 19.—Canmakers are placing tin plate requirements in anticipation of good crops of both corn and tomatoes. Third quarter contracts for tin plate of one large canmaker already have been executed and added requirements are about to be placed, which from all indication will exceed quarterly shipments by 100,000 base boxes. Tin plate demand for the general run of fabrication is satisfactory, with the exception of paint can stock, and demand in this direction has been slow owing to rainy weather last spring which has tended to defer house painting and consequently to curb the production of containers for this purpose.

Export Demand Heavier

New York, Aug. 19.—Close to 40,000 base boxes of tin plate are pending in the export market and are likely to be closed at any time. No foreign buying of consequence has been noted since the Nippon Oil Co. closed on 26,000 boxes last week. Domestic buyers now are bringing out their specifications for October. One seller stated that with the exception of one instance his customers have covered for that month. Domestic business is at least being maintained at the improved rate prevailing recently.

Booked to 75 Per Cent

Philadelphia, Aug. 19.—Tin plate specifications are coming in more freely, with one seller booked up to 75 per cent of fourth quarter production. Production of tin plate is held firmly at $5.50, Pittsburgh. Stock material is slightly more active, holding at $5 to $5.15, the latter price on larger items.

Fluorspar Demand Better

Pittsburgh, Aug. 19.—A slightly better demand for fluorspar is apparent this week, reflecting better operations in the steel industry. An order for 500 tons was taken by a seller at $18.50, Marion, O., to which was added a freight rate of $5.25. Inquiry for dolomite comes up for quotation from time to time. A dealer reports the sale of a couple of carloads of this grade this week.

Week's Imports Listed

Philadelphia, Aug. 19.—Included in imports at this port during the past week are 1990 tons of manganese ore from British India; 6800 tons of iron ore from French Africa and 7523 tons of iron ore from Sweden; 424 tons of structural steel from Belgium and nine sheets of steel from Sweden.

Concrete Bars Inactive

Large Inquiries and Awards Remain Lacking but Small Jobs Aggregate Fair Tonnage—Prices Maintained in Most Districts

REINFORCING BAR PRICES, PAGE 451

Chicago, Aug. 19.—Estimating departments of reinforcing bar sellers had comparatively little to do last week, while sales forces were unable to get into the award volumn the numerous good-sized projects which have been on the verge of being let. The general contract for the Twenty-third street viaduct has been awarded to Avery Brundage, 110 South Dearborn street, and this should release 700 tons of bars shortly. The Hegeman-Harris Co., 400 North Michigan avenue, has the general contract for the Eitel building, requiring nearly 500 tons. The price tendency still is downward and a range of 2.25c to 2.35c, Chicago, now blankets most current business.

Small Orders Maintain Market

Pittsburgh, Aug. 19.—Activity in the reinforcing concrete bar market largely is confined to small orders averaging from 15 to 20 tons each. Not many jobs are up for negotiation in this district. Fabricators now are preparing figures on a 150-ton job for a new baking plant of the P. H. Butler Co., bids on which close Aug. 25. Reinforcing concrete bars continue quotable at 2.15c, Pittsburgh, while out of warehouse the price continues to range from 2.30c to 2.35c.

Weaker Price Aids Buying

Buffalo, Aug. 19.—A fair volume of new business is being placed both by structural and road contractors. Reduction of prices to a basis of 2.15c to 2.20c, Pittsburgh, for bars from stock, has brought out some tonnage that had been deferred. The lower prices had to be made to meet competition of small mills which were seeking business direct from contractors. Bookings of this district last week include a lot of 300 tons for a Buffalo garage, and several road contract jobs of 80 to 100 tons.

Price Levels Firmer

Cleveland, Aug. 19.—Reinforcing concrete bar demand is maintained here, although most of the activity is confined to small tonnage lots. Concrete Steel Co. was awarded 132 tons in three projects in Kentucky. Paterson-Leitch Co. was awarded 250 tons for roadwork in Ohio, this being both bars and steel mesh. Prices appear firmer at recent levels, due to increased bookings of small tonnages. Rail steel bars continue to go at 1.90c to 2.00c, mill, with the lowest available only on attractive tonnages. New billet bars are quoted at 2.10c to 2.20c, with most of the small tonnage at the higher figure. On stock bars, 2.30c to 2.45c, Pittsburgh, is being figured. On attractive lots, 2.30c probably could be done.

Inquiry Unusually Quiet

Cincinnati, Aug. 19.—Little inquiry developed over the week for reinforcing concrete bars. Most of the fresh projects under consideration entail but meager tonnages. Sellers in some cases are free to entertain tonnages for reasonably prompt delivery and are doing so whenever the requirement proves attractive. Demand still is restricted by reason of new projects being held in subjection. A major garage which when completed will represent an expenditude of $500,000 will be built by the Ferro Concrete Construction Co. at Fourth and Sycamore streets. The garage will be a 4-story brick, steel and concrete structure. Moderate tonnages of bars continue to be quoted at 3.30c, Cincinnati warehouse.

CONCRETE CONTRACTS PLACED

Awards this week	1,232 tons
Awards last week	3,490 tons
Awards two weeks ago	4,035 tons

300 tons, garage, Buffalo, N. Y., to unnamed fabricator.
250 tons, roadwork in Ohio, to Paterson-Leitch Co.
250 tons, hospital building at Woodville, Pa., to the Metzger-Richardson Co.
200 tons, roadwork projects in New York state, to unnamed fabricators.
132 tons, three construction projects in Kentucky, to Concrete Steel Co.
100 tons, addition to Ohio hotel, Youngstown, reported to Truscon Steel Co.

CONCRETE CONTRACTS PENDING

150 tons, building for the P. H. Butler Co., Pittsburgh; bids close Aug. 25.
Tonnage unstated, 8-story apartment building at Fargo and Greenview streets, Chicago, for which Roy F. France, 155 North Clark street, Chicago, has drawn plans.
Tonnage unstated, superstructure for Illuminating Co. plant, Lakeside avenue, Cleveland; bids in.
Tonnage unstated, building for F. W. Woolworth Co., Cleveland; pending.

Pipe Mill

Order Books Better—Prices Firmer—Cast Iron Buying Continues Good

PIPE PRICES, PAGE 451 AND 504

Pittsburgh, Aug. 19.—Prices on oil country goods are on a firmer basis. With the exception of one or two cases where the producers in question are in need of certain sizes and are making a strong effort to schedule tonnage, card discounts are being supported more rigidly than for many months. Line pipe is in fairly good demand and with makers gradually increasing their obligations it is becoming increasingly difficult to locate a source of supply which is in a position to entertain business for prompt delivery. Merchant sizes also share in the current improvement of the pipe market although the demand has not yet blotted out shipping dates of an attractive character.

Private Buying Maintains Market

New York, Aug. 19.—Both the local cast iron and steel pipe markets are featured by little in the way of large orders. Municipal demand for cast iron pipe is sluggish and it is only by virtue of a steady flow of private business that the market is being firmly maintained at the prices which have prevailed for some time past. Option by the Replogle interests on the plant of the Warren Foundry & Pipe Co., Phillipsburg, N. J., the largest independent, closes Aug. 26.

Less Inquiry Is Out

Chicago, Aug. 19.—Cast iron pipe makers note a slight falling off in inquiry but as a general rule shipments are not shortening order books to any marked extent. Current business is mostly the total of a number of jobs of 50 tons or less. The 1050 tons at Lincoln Park, Detroit, has gone to the American Cast Iron Pipe Co. Quotations at Chicago are $52.20 to $53.20, for 6-inch and over and $56.20 to $57.20 for 4-inch.

Outlook Best in Months

Birmingham, Ala., Aug. 18.—Cast iron pipe interests report a better outlook for business than any time within the past six months. The improvement in business activity has been marked during the past few weeks. Lettings are coming in steadily. Reports have been current that concessions have been made on pipe prices but no change is given in the list of quotations. The soil pipe trade notes but little better activity since the $5 recession in prices. Mergers and combinations of soil pipe manufacturers in the Alabama and southern territory are attracting attention.

CAST IRON PIPE PLACED

1050 tons, Lincoln Park, Detroit, to American Cast Iron Pipe Co.
400 tons, St. Paul, to National Cast Iron Pipe Co.
200 tons, Ames, Iowa, to American Cast Iron Pipe Co.
150 tons, West Allis, Wis., to a contractor.

Wire Products

Prices Have Eased Off—Buying More Active—Nails Weaker

WIRE PRICES, PAGE 451

Pittsburgh, Aug. 19.—Prices of wire and wire products have eased off slightly in the face of more open trading. While some producers a week ago were quoting 2.60c, base Pittsburgh, on plain wire business in view of competition at $1 a ton lower, they since have revised quotations down to 2.55c, base Pittsburgh, to participate in present offerings. Nail prices also have been clipped off $1 per ton and now are quoted at 2.80c, base Pittsburgh. The price of other wire products generally receded in the same proportion. Better buying is experienced by most producers of wire products in this district which is due largely to the belief now held by consumers that prices have receded to as low a point as can be expected. There is some disposition on the part of jobbers to build up their stocks and producers are entering more tonnage.

Prices Firm at Buffalo

Buffalo, Aug. 19.—Wire demand is fairly strong, and quite well distributed. Prices are firm on the basis of 2.60c, Pittsburgh for plain wire. Operating schedules at local mills will be readjusted when extensive alterations and repairs now in progress are completed early next month. Repairs include relining of two blast furnaces at the Wickwire river road plant.

Nails Easier; Wire More Active

New York, Aug. 19.—Nail sellers generally have met the 2.80c Pittsburgh price recently established by two mak-

ers, in so far as regular customers are concerned. At least one seller is refusing to quote below 2.85c to outsiders. Although the nail business is easier, the wire market as a whole is manifesting increasing activity. Wire rods are easily available at $46, Pittsburgh, although in some quarters $48 still is being done.

Improvement More Marked

Chicago, Aug. 19.—New business from both jobbers and manufacturers of wire and wire products has been decidedly better and bookings last week were the highest in several months. The price situation is none too satisfactory and while 2.60c, Pittsburgh, still governs for most business in plain wire, 2.55c has been done. It is reported that 2.80c, Pittsburgh, is becoming general for wire nails.

Buying from Warehouse Steadily Improves

WAREHOUSE PRICES, PAGE 498

New York, Aug. 19.—Slight but steady improvement prevails in demand for iron and steel products out of warehouse here. According to some leading interests, trading so far this month well exceeded the rate prevailing in July. A feature of the past few days has been a substantial increase in demand for galvanized sheets. As there appears to be some difficulty in adjusting price views, orders have as yet shown no marked increase. Trading in reinforcing bars and shapes remains the feature. Prices generally are unchanged.

Trading Slightly Improved

Philadelphia, Aug. 19.—Warehouse prices on iron and steel products are steady. Trading has improved slightly. Especially noticeable is the better demand for galvanized products. Buyers apparently are contemplating fall repair work.

Buying Falling Off Slightly

Cleveland, Aug. 19.—Iron and steel buying from warehouses here has fallen off slightly in the past week or ten days, a typical summer dullness. One large dealer reports as good business so far in August as was booked in July, with prices firmly maintained. Mill representatives are booking good orders and dealers expect this to be reflected in warehouse activity shortly.

Demand Generally Improved

St. Louis, Aug. 18.—Some improvement in demand in general was reported by warehouses. Machine shops have been better buyers during the past 10 days or two weeks than during the two or three months preceding. There has been a fair movement of rounds and shapes, a large portion of which have moved to Memphis, Little Rock and other southern districts. The demand for sheets continues quiet, but building materials are being purchased actively in a small way, the tonnage making a fair showing in the aggregate. Road building materials are in good demand, two leading interests reporting having received fill-in orders since Aug. 1. Purchasing by the railroads has developed decided improvement during the past two weeks.

Sheet Purchases Larger

Week's Business at Pittsburgh Better Than Any Seven-Day Period Since May—Prices Show More Firmness

SHEET PRICES, PAGE 451

Pittsburgh, Aug. 19.—Buying interest in the sheet market this week has been highly satisfactory with the volume of tonnage recorded as the largest for any seven-day period since April 1. At the forefront of the improvement is the fact that jobbers, whose stocks largely find their way into agricultural districts, are buying good size tonnages of various grades in anticipation of better rural demand. Their purchases to a large extent are being filled out of stock. Another factor on the constructive side of the market is the increased interest displayed by numerous consumers in lining up requirements for fourth quarter and some of these involve worth while tonnages. The policy of some producers, however, is to refrain from booking tonnage for fourth quarter production until prices are on a profitable basis. At the present rate of operation, few mills, if any in this country, are in a position to enter tonnages of black on the right side of the ledger, and until operation gets into higher grounds the attitude of producers largely is to reject any placements for shipment during the last quarter. Prices are showing more firmness right along, with blue annealed quotable at 2.70c, black at 3.50c, and galvanized at 4.60c, Pittsburgh. Automobile sheets are held at 4.75c for No. 22 gage. The American Sheet & Tin Plate Co. is quoting these prices on all tonnage entered prior to Aug. 31 for delivery not later than Sept. 30. Its operation this week shows an increase, with 45 per cent of capacity engaged.

Sheet Prices Soft

Boston, Aug. 19.—Lack of confidence in sheet prices holds buying on a hand-to-mouth basis. Galvanized sheets nominally held at 4.60c, Pittsburgh, are selling in this market at 4.50c and 4.55c. Blue annealed are somewhat firmer but black sheets have recently dropped below the prices quoted a week ago.

Business Improving

Buffalo, Aug. 19.—Sheet sales and inquiry are on the up grade, stovemakers having been among the new consumers in the market last week. Automobile manufacturers also show interest in sheets for fourth quarter delivery. A survey made by a local maker shows 28 of 30 mills in the eastern section of the country are quoting black sheets at 3.50c, Pittsburgh, while two are quoting 3.40c and they are not regarded as giving sufficiently serious competition to warrant its being met at this time. Local production, now at slightly more than 55 per cent of capacity, will be increased before Sept. 1 if demand holds to present proportions.

Increase Barely Perceptible

Chicago, Aug. 19.—Bookings by makers of steel sheets continue their upward trend but the pace is disappointingly slow most of the time. New business continues to represent an aggregate of a number of small orders. While Chicago district makers assert their minimums are 2.70c, Pittsburgh, for blue annealed, 3.50c, Pittsburgh, for black and 4.60c, Pittsburgh, for galvanized, users claim that eastern makers have made still lower prices.

Eastern Trade More Active

Philadelphia, Aug. 19.—Sheet demand is showing more life. Orders are more numerous and involve larger tonnages. Several were placed recently, ranging from 100 to 200 tons. The Reading railroad has closed on several small lots of galvanized and black sheets. The Pennsylvania railroad continues to negotiate for its needs. Blue annealed appears firmly established at a minimum of 2.70c, Pittsburgh, and galvanized at 4.60c. Black is moving generally at 3.50c, although slightly less can still be done from some of the smaller mills. Automobile sheets bring 4.75c to 4.90c. Automobile seconds have almost disappeared from the market, relieving competition against black sheets.

Old Orders Cleaned Up

Youngstown, Aug. 19.—Better steel sheet buying, especially full-finished sheets for autobody building, distinguishes the trade here this week. The receipt of more numerous and slightly larger inquiries also encourages the mills to believe expansion in trade is coming along steadily if very gradually. More sheet mills are active this week in the valleys than was the case last week. Makers of full-finished sheets have received among other inquiries one for 2000 tons and another for 1700 tons and are greatly encouraged. This especially is true because old orders finally have been cleaned up and the present mill activities are based upon entirely new business. Further evidence of expanding sheet mill activity is found in placing of releases for fair-size tonnages of sheet bars, undelivered from the second quarter. Sheet quotations are unchanged at 3.50c, Pittsburgh, for No. 28 gage black, 4.60c for No. 28 gage galvanized; and 2.70c for No. 10 gage blue annealed. The new price of 4.75c for No. 22 gage autobody sheets is holding steadily, buyers thus being encouraged to come back into the market.

Will Build Steel Foundry

Oakland, Cal., Aug. 16.—The American Manganese Steel Co. will erect a plant in Los Angeles to occupy an area of about 15,000 square feet, with a capacity of 100 tons per month. This plant will be operated as a branch of the Oakland foundry where the main Pacific coast headquarters are located. Increased consumption of manganese steel castings on the coast, with a desire on the part of the company to render better service to consumers in the Los Angeles district is given as the reason for the new foundry plant. An electric furnace and other necessary equipment will be purchased. D. H. Young is Pacific coast manager, with headquarters in Oakland, Oakland Mole sub-station.

Shape Awards Still Heavy

Many Projects Continue To Swell Weekly Aggregate—Large Jobs Are Fewer—Inquiries Maintained in Good Volume—July Bookings Gain

STRUCTURAL SHAPE PRICES, PAGE 451

Washington, Aug. 19.—Estimated total bookings of structural steel in July, totaling 182,000 tons, were 10,400 tons higher than those of June, according to reports to the department of commerce. Actual bookings in July of 165,240 tons were reported by 161 companies having a monthly capacity of 236,345 tons. This placed operations at 70 per cent, as compared with 66 per cent in June, when 184 companies with 244,615 tons capacity reported bookings of 161,182 tons. The July total is the highest since March when when 179,866 tons was booked, giving shops 73 per cent capacity business that month.

The table below lists statistics reported by 184 identical companies, including data in earlier months for seven now out of business, with a present capacity of 240,945 tons per month, compared with 244,345 tons in 1923 and 237,415 tons in 1922. For comparative purposes the percentage figures are prorated to obtain an estimated total for the United States based on a capacity of 250,000 tons per month for 1922 and 260,000 tons per month in 1923 and 1924.

	Actual bookings tons	Per cent of capacity	Estimated total bookings
January	179,337	72	187,200
February	192,270	77	200,200
March	229,733	92	239,200
April	193,639	78	202,800
May	140,558	56	145,600
June	125,531	50	130,000
July	125,105	50	130,000
August	143,402	57	148,200
September	129,999	52	135,200
October	121,298	49	127,400
November	132,666	54	140,400
December	195,607	80	208,000
January, 1924	175,639	72	187,200
February	179,866	73	189,800
March	174,465	71	184,600
April	159,254	65	169,000
May	145,430	59	153,400
June	161,182*	66	171,600
July	165,240**	70	182,000

*Reported by 184 companies with a capacity of 244,615 tons.
**Reported by 161 companies with a capacity of 236,345 tons.

Inquiry Shows Improvement

Boston, Aug. 19.—Bids are being taken for 1500 tons for a bank building in Boston and several other projects of a similar character are in the making. Fabricators almost without exception look for a good volume of business in the fall. The present rate of operation is about 80 per cent of capacity in Boston. The structural shape price for large tonnage lots is close to 2.00c, base Pittsburgh, although the principal makers are holding firm at 2.10c.

Number of Contracts Maintained

New York, Aug. 19.—Structural sales the past week involve few outstanding tonnages. From the standpoint of number both orders and inquiries were fairly well maintained. Apartment house work dominates local demand. Bridgework took a little spurt, fully 2000 tons of miscellaneous business being placed. A leading industrial inquiry calls for a 1000-ton power house for the Narragansett Light & Power Co. at Providence.

the several large projects requiring 10,000 tons or more, discussed here from time to time, the power plant of the New York Edison Co., requiring possibly 15,000 tons, appears the more likely to come along first. Plain material prices are unchanged at 1.90c to 2.15c, Pittsburgh.

Activity Slowest in Two Weeks

Philadelphia, Aug. 19.—Structural shape activity is slower than in two weeks. A fair volume of inquiries is coming out but these do not run into heavy tonnage. The largest new project is for 4500 tons for the Penn Athletic building. Plain material continues to be quoted at 1.90c to 2.15c, Pittsburgh.

Specifications at Better Rate

Pittsburgh, Aug. 19.—Specifications on old jobs are coming in at a better rate and structural shape producers report an improved feeling of confidence. Tonnage is slightly larger but some companies report that four or five jobs probably would involve an aggregate of 150 tons. The structural market is quotable at a range of 2.00c to 2.15c, base Pittsburgh, depending upon the tonnage. The McClintic-Marshall Co. was awarded 1200 tons for the new boiler house of the Standard Oil Co. of New Jersey as well as 600 tons, mostly girders, for a bridge which the New York Central railroad is about to construct near Chicago.

Few Large Projects Out

Cleveland, Aug. 19.—Few projects involving large tonnages of structural shapes now are active. Small jobs continue numerous. Inquiries are few and for small tonnages. The building for F. W. Woolworth Co. remains unplaced, although keen price competition developed over the 700 tons involved. Bids are in on a 10-story building for which W. L. Lougee is architect, and this is expected to involve a good steel tonnage. Plain material prices continue firm at 2.10c, Pittsburgh, with small projects going at a higher price. Some quotations on fabricated bids show prices to be nominal, a range of from $10 to $15 being noted on some projects.

Activity More Encouraging

Chicago, Aug. 19.—Structural steel awards continue at a high level and activity in shapes is outstripping the other finished steel lines. While most awards range from 200 to 500 tons, the aggregate is large. Fabricators have been heavy buyers of plain material. One maker of plain material booked 2300 tons for 7 jobs last week. The general contract for the Eitel theater and office building has been awarded to Hegeman-Harris Co., 400 North Michigan avenue, Chicago. The 2100 tons in the Illinois Women's Athletic Club building is on the verge of being placed, while the Louisville & Nashville, Rock Island and Kansas City Southern railroads have inquiries out for 2100 tons for bridge work. The University of Chicago medical school building program will bring several thousand tons into the market shortly. While some plain material still is being sold for 2.25c, the single price of 2.15c appears representative.

Market Inactivity Grows

Cincinnati, Aug. 19.—Numerous small jobs involving light tonnages of structural shapes are under estimate at fabricating departments in this district, with the demand less active than in many weeks. Structural awards this week are small. Tank fabricators have numerous inquiries for various sized holders but delayed action is reported. Business in this direction is particularly quiet. Plain material prices are steady at 2.10c, base Pittsburgh, except for one mill which is shading to 2.05c.

STRUCTURAL CONTRACTS PLACED

Building awards this week ..... 16,364 tons
Building awards last week ..... 23,274 tons
Building awards two weeks ago.... 32,366 tons

2000 tons, Plankinton Arcade, Milwaukee, to American Bridge Co.
1500 tons, Catholic high school, Brooklyn, N. Y., to Heddon Iron Construction Co.
1400 tons, Western Electric Co. addition at Washington & Bethune streets, New York, to Hay Foundry & Iron Works.
1200 tons, boiler house for the Standard Oil Co. of New Jersey, to the McClintic-Marshall Co.
1200 tons, Udall apartment, Columbia Heights, Brooklyn, N. Y., to Levering & Garrigues Co.
900 tons, building for Dominion Alloy Steel Co., Sarnia, Ont., to the Sarnia Bridge Co.
700 tons, addition to the Museum of Natural History, New York, to the Cutler Iron Works.
700 tons, Southern railroad, bridges between Bulls Gad and Eadville, Tenn., to McClintic-Marshall Co.
650 tons, Haddon Hall addition, Atlantic City, N. J., to Lehigh Structural Steel Co.
600 tons, New York Central bridge, Dune Park, Ind., to McClintic-Marshall Co.
600 tons, Rutgers Presbyterian church, Broadway and Seventy-third streets, New York, to Harris Structural Steel Co.
512 tons, Rawson Laboratory, Chicago, to American Bridge Co., E. L. Scheidenhelm, 111 West Monroe street, Chicago, general contractor.
500 tons, Westinghouse Electric & Mfg. Co. plant at Mansfield, O.; reported awarded unnamed fabricator.
400 tons, two bridges for Florida Western & Northern Railroad Co., subsidiary of the Seaboard Air Line, to American Bridge Co.
400 tons, Y. M. C. A. building, Waterbury, Conn., to the Palmer Steel Co.
400 tons, for 300-ton bridge in York street, Philadelphia and a 100-ton bridge at Rochester, N. Y., both for the Pennsylvania railroad, to the McClintic-Marshall Co.
375 tons, boiler house and conveyor structure for By-products Coke Corp., Chicago, to American Bridge Co.
325 tons, power house for the New Jersey Public Service, to the Pittsburgh Bridge & Iron Works.
324 tons, bridge over Colorado river near Bastrop, Tex., to Kansas City Structural Steel Co.
300 tons, plant for Birtman Electric Co., Chicago, to A. Bolters' Sons.
275 tons, Memorial hall, Hibbing, Minn., to Lakeside Bridge & Steel Co.
254 tons, power house for the Western Shade Cloth Co., Chicago, to Wendnagel & Co.
250 tons, Union Market building, St. Louis, to the Spuck Iron & Foundry Co.
250 tons, Santa Fe railroad ice plant at Winslow, Ariz., to the Union Iron Works.
200 tons, Consolidated Gas Co., Bronx, N. Y., to Post & McCord.
200 tons, municipal bridge, Lansing, Mich., to Wisconsin Bridge & Iron Co.
200 tons, two headframes, for Pickands, Mather & Co., at Duluth, Minn., to Lakeside Bridge & Steel Co.
200 tons, two dormitory buildings, for the Rensselaer Polytechnic institute, Troy, N. Y., to the Palmer Steel Co., which also booked a

small lot for wireless towers for the Travelers Insurance Co.
150 tons, bridge for Nickel Plate railroad near Lorain, O., reported awarded Fort Pitt Bridge Works.
150 tons, transfer bridge for the Pennsylvania railroad at Cape Charles, to the Port Pitt Bridge Works.
149 tons, deck plate girder bridge over Cross Lake near Shreveport, La., to American Bridge Co.

STRUCTURAL CONTRACTS PENDING

7500 tons, Eitel theater and office building, Chicago; general contract awarded to Hegeman-Harris Co., 400 North Michigan avenue, Chicago.
2200 tons, building for the Liberty Title & Trust Co., Philadelphia; general contract awarded to Irwin & Leighton, that city.
2000 tons, four schools, New York; general contract awarded as follows: School numbers 122 and 136, each involving 1200 tons, to De Riso Bros; No. 145, involving 500 tons, to Lusdader Construction Co. and No. 144, requiring 300 tons, in abeyance.
1600 tons, bridges for Louisville & Nashville railroad; bids in.
1500 tons, Mississippi river shipbuilders for three government dredge hulls; pending.
1200 to 3600 tons, American Insurance Union, Columbus, O.; John Gill & Son, Cleveland, awarded general contract.
800 tons, rod and wire mill, American Smelting & Refining Co., Baltimore; pending.
800 tons, hotel at French Lick, Ind.; pending.
700 tons, warehouse for Bailey Co., Cleveland; being redesigned.
700 tons, power plant addition for Narragansett Electric Light Co., Providence, R. I.; bids in Aug. 30.
550 tons, buildings for New York Central railroad at Elkhart, Ind.; bids in.
500 tons, apartment for Ravitch Bros., 956 Fifth avenue, New York; pending.
328 tons, Julius street wharf extension, New Orleans; bids in.
225 tons, two locks in Ohio river; pending.
200 to 300 tons, highway bridges in Ohio; general contracts awarded.
150 tons, hospital and telephone buildings, Meadville, Pa.; bids in soon.
100 tons, plant for Clayton Mark & Co., 111 West Washington street, Chicago; pending. The Austin Co., Cleveland and Chicago, is architect and engineer.
Tonnage unstated, 15-story medical-dental building at Lake Shore drive and Ontario street, Chicago; plans being drawn by John Eberson, 212 East Superior street, Chicago.
Unnamed tonnage for a Felson apartment, West Thirty-first street, New York; bids asked. This is the third project to be brought out by this interest recently, the other two having been placed with A. E. Norton, Inc.

Stoker Company Acquires Allied Industry

The Sanford Riley Stoker Co. has taken over the entire business of the United Machine & Mfg. Co., Canton, O. From now on the business of the United company will be handled in the name of the Sanford Rilev Stoker Co. The head office will be at Worcester, Mass., with plants at Worcester, Mass., Detroit, and Canton. The consolidation of these two companies will result in the most complete line of underfeed, overfeed and chain grate stokers under one head. With many types of stokers to choose from, it will be possible to handle any solid fuel from the highest grade semi-bituminous down to the poorest grades of culm, lignite, anthracite screenings, coke breeze, refuse, etc. This consolidation makes available to the stoker buying trade the combined engineering and manufacturing talent of the two companies, and it will be possible to offer a type of stoker suitable for every possible combustion need. Separators previously made by the United company will be manufactured and sold by the A. W. Cash Co., Decatur, Ill., manufacturer of boiler specialties and combustion control. The Cash company is a subsidiary of the Sanford company.

Equipment Market Dull

Chesapeake & Ohio Authorizes Immediate Purchase of 2000 Hoppers —1925 Rail Specifications Expected from Northwestern Roads

RAILROAD TRACK MATERIAL PRICES, PAGE 451

New York, Aug. 19.—Car buying again is restricted to few orders. Inquiry appears as dull as at any time in several weeks. The locomotive market is enlivened by an inquiry for 25 Mikado type locomotives for the Illinois Central.

An encouraging factor in the market is the report that the Illinois Central railroad, Chicago, is about to inquire for 6400 cars of miscellaneous types. The formal inquiry has not yet been received here. The American Refrigerator Transit Co. has awarded repairs to 700 underframes for refrigerators to the Sheffield Car & Equipment Co.

Car Orders

July	886
June	438
May	511
April	10,250
March	13,150
February	41,350
January, 1924	8,150
December	11,600
November	5,050
October	1,125
September	897
August	2,780
July	1,450
June	1,785
May	2,255
April	9,800
March	42,500
February	9,300
January, 1923	15,000
1923 total	103,487

To Buy 2000 Hopper Cars

Cleveland, Aug. 19.—Immediate purchase of 2000 70-ton hoppers and 10,000 tons of 130-pound steel rails was authorized today by the directors of the Chesapeake & Ohio railroad. It is expected that the rails will be purchased immediately for laying this season.

Track Material Buying Still Lags

Pittsburgh, Aug. 19.—Makers of track material have been able to withstall any effort to purchase supplies at less than the going prices in the past few weeks. Some producers have not receded from their market position of 2.80c, base, on standard spikes although sales are encountered at 2.75c. Not much buying is apparent although railroad requirements are held as a constructive factor. Small spikes are quotable at 3.25c, base, with extras on the new list to apply. Tie plates are quotable from 2.50c to 2.55c. base Pittsburgh, but buying is at a low rate. The improvement in sales of light rails continues, going prices ranging from 1.90c to 2.00c. Certain railroads are releasing more tonnage of standard rails, prices of which continue at $43, mill, on 500 tons or more.

Still Looking to 1925

Chicago, Aug. 19.—Railroad business now is more prospective than actual but steel makers look for heavy rail and track fastening orders and fair business in cars to be placed within the next few weeks. The northwestern railroads have been the poorest buyers for several years, owing to the agricultural depression in the territory they serve, and with the enhancement in grain and livestock prices these carriers doubtless will be unusually large buyers.

No releases on rail contracts were received last week but some are looked for this week. The Great Northern railroad is inquiring for 200 tank cars and the Northern Pacific for 15 underframes.

CAR ORDERS PLACED

American Refrigerator Transit Co., repairs to 700 refrigerators, to Sheffield Car & Equipment Co.
Barnsdall Refining Co., 50 tank cars, to Pennsylvania Car Co.
Mill Power Supply Co., 10 flat cars, to Kiley Car & Foundry Co.
Quaker City Tank Line, Inc., St. Louis, 200 tank cars, 125, 8050-gallon tanke cars and 75 10,050-gallon coiled cars, to the Standard Tank Car Co.
Western Fruit Express, 100 underframes for refrigerators, to Cambria Steel Co. Reported 500 additional underframes awarded to American Car & Foundry Co.

CAR ORDERS PENDING

Baltimore & Ohio, 80 suburban coaches for Staten Island Rapid Transit Co., New York; still pending.
Chesapeake & Ohio, 2000 70-ton hopper cars; immediate purchase authorized.
Great Northern railroad, 200 tank vars; pending.
Illinois Central, Chicago, reported about to inquire for 6400 cars of miscellaneous types. Formal inquiry not yet out.
Northern Pacific railroad 15 underframes; pending.
Rapid Transit Construction Co., Brooklyn, N. Y.; 150 car bodies and trucks; still in abeyance.

British Export Trade in July Shows Decline

Birmingham, Eng., Aug. 7.—The pronounced fall in the Middlesbrough exports of iron and steel registered in June was followed by a further decline in July. Foreign exports of pig iron totaled 20,161 tons compared with 25,452 tons the previous month and shipments of manufactured steel were reduced from 37,073 tons to 31,580 tons.

The United States bought 475 tons of pig iron in June, but none in July. The principal buyers were Belgium, taking 5705 tons; Italy 3491 tons; France 2519 tons, and Germany 1975 tons. The coastwise sales totaled 12,363 tons.

Shipments of manufactured steel in July totaled 31,580 tons compared with 37,073 tons in June. Coastwise shipments also reduced from 8756 tons to 7845 tons. The heaviest tonnages were forwarded to India which received 9287 tons compared with 12,371 tons in June. Hong Kong takes second place receiving 2972 tons, and Japan ends the next best customer for 2367 tons. July is usually a month of minimum shipments, but the export trade has been unusually quiet.

The net income of the American Rolling Mill Co., Middletown, O., for the quarter ended June 30 last, was $1,494,272 after interest and federal taxes. For the six months ended June 30 net income was $2,381,639, or $2.45 a share.

The Nonferrous Metals

Strong Prices Continue and Some Advance Sharply—Zinc Buying Improves—Tin Irregular—Brass Rolled Products Up

	Copper—Electro delivered	Copper—Lake delivered	Spot tin Straits New York	†Lead New York basis	Zinc St. Louis basis	Spot† aluminum	Spot antimony	Spot nickel
Aug. 13	13.75	13.87½	51.75	8.00	6.17½	27.00	9.00	28.00
Aug. 14	13.75	13.87½	52.62½	8.12½	6.17½	27.00	9.12½	28.00
Aug. 15	13.75	13.87½	52.75	8.25	6.20	27.00	9.25	28.00
Aug. 18	13.75	13.87½	52.37½	8.25	6.20	27.00	10.00	28.00
Aug. 19	13.75	13.87½	52.37½	8.25	6.25	27.00	10.50	28.00

†Outside market quotation.

NEW YORK, Aug. 19.—Strong metal markets have prevailed through another week, reflecting the bullish sentiment in the trade inspired by the agreement between the allies and Germany in respect to the program for the application of the Dawes plan. Considerable metal has been bought on the rise by people who are hoping thereby to anticipate improved business conditions. However, actual consumption has improved. Buying of metal products by ultimate consumers has expanded. Shipments of metals in August show signs of exceeding July by a good margin. European demand for all the metals is gaining. All the principal nonferrous metals have joined in the improvement.

Electrolytic copper has held at 13.75c, delivered Connecticut, for prompt to November deliveries; and at 13.62½c, f.a.s. New York for export. Copper and brass rolled and drawn products recently have been advanced twice, ¼ cent each time, on Aug. 11 and Aug. 14. Seamless tubes were advanced ½ cent on the first date and left unchanged on the second date. Discounts off the extras on rolled brass and nickel silver were reduced from 33 1/3 to 25 per cent. This includes seamless copper tubes, but not seamless tubes of other mixtures on which the extras now become net. Casting copper advanced to 13.25c; lake to 13.87½c, delivered.

The zinc market has been strong, with better buying by galvanizers, continued export interest and some further accumulation by operators. The price has been holding 6.20c East St. Louis, and today little could be had under 8.25c for August shipment, with 2½ points premium for each month ahead.

Lead prices have advanced sharply, the American Smelting & Refining Co. following the outside market. The Smelting company on Aug. 15 announced another ¼ cent rise to 8c, New York. Following this advance the open market went to 8.25c New York, 8c St. Louis. The demand for lead has been extremely heavy.

Tin has been irregular, but buying by consumers has improved, especially of nearby deliveries. The market has ranged between 52c and 53c, the past week. Sterling exchange rates have fluctuated between $4.50 and $4.54.

Antimony prices advanced sharply Aug. 18 to 10c, duty paid, on speculative operations in the Orient, together with higher silver costs. Europe has been inquiring actively in America as well as in the Orient.

The aluminum market has been strong, with improved buying. Several second half contracts have been made recently. Virgin ingot prices are unchanged.

Mill Products

Base prices cents per pound, f.o.b. mill

SHEETS	
Copper, hot rolled	20.62½
High brass	17.25
Zinc, ga. 9 to 18 (plates ½c less)	9.50
Lead, full sheets (cut ¼c more)	11.50
Aluminum, bright, 0 to 35 gage	37.50 to 92.00
SEAMLESS TUBES	
High brass	21.50
Copper	22.75
RODS	
High brass, round, ¼ to 2½ inch	15.00
Naval brass rods	17.75
WIRE	
Copper	15.75 to 16.00
High brass	17.75

Old Metals

Dealers' buying prices cents per pound

HEAVY RED BRASS	
Cleveland	9.00 to 9.25
New York	8.00 to 8.50
Chicago	9.00
HEAVY YELLOW BRASS	
New York	6.25 to 6.75
Chicago	7.25
Cleveland	6.50 to 6.75
ZINC	
New York	3.25 to 3.50
Cleveland	3.50 to 3.75
Chicago, dross	4.37½
HEAVY COPPER AND WIRE	
Cleveland	11.00
New York	10.75 to 11.00
Chicago	11.00
RED BRASS TURNINGS	
New York	7.50 to 7.75
Cleveland	8.25 to 8.50
Chicago	8.50 to 8.75
YELLOW BRASS TUBING	
Cleveland	7.00
NO. 1 BRASS ROD TURNINGS	
Cleveland	7.00
New York	7.00 to 7.25
Chicago	7.25
ALUMINUM BORINGS	
Cleveland	10.00

Secondary Metals

Casting copper, refinery	13.25
Remelt aluminum No. 12	21.00 to 21.50

Fire Damage Limited

Damage caused by the recent fire at the Old Hickory Powder plant, near Nashville, Tenn., was limited to the government buildings and machinery, as well as munitions. The equipment and buildings owned and occupied by the Nashville Industrial Corp. were not damaged badly. None of the equipment being offered for sale by that company was damaged or lost except ice machines. Regular business is being continued and deliveries made as usual. Old Hickory plant was built in 1918, being the largest munitions development during the war and in 1920 was sold to the Nashville Industrial Corp. The government reserved the privilege of storing the smokeless powder for five years agreeing to protect the buyer from loss or damage resulting from such storage. Practically all of the equipment damaged was that reserved for the government for use of the ordnance department.

Sulphate Advances

Stimulated Demand Strengthens Quotations—Benzol Market Steady

New York, Aug. 19.—Quotations on sulphate of ammonia have undergone an advance. The appearance of several inquiries from the Orient, the first in many weeks, has stimulated the export market, which now is holding at $2.60 to $2.65, port, for material in double bags. This is an advance of five cents. Domestic prices have made a similar gain, now holding at a range of $2.40 to $2.45 per 100 pounds, works. A fairly active demand for both spot and contract supplies in conjunction with substantially reduced stocks is the dominating factor.

While demand for industrial benzol can hardly be described as active, shortage of supplies, due to curtailed production, which as yet has shown no change for the better, and absorption of material by motor fuel contracts has contributed a steadying influence. Pure benzol is holding at 25 cents producers' plants in tank lots and 30 cents in drums; 90 per cent, at 23 cents in tanks and 28 cents in drums; commercial xylol, 26 cents works in tanks and 21 cents in drums; toluol, 29 cents in tanks and 31 cents in drums and solvent naphtha, 25 cents in tanks and 30 cents in drums. Sellers of prime white naphthalene are quoting firmly at 6 cents for flakes and 7 cents for balls. Phenol is unchanged at 25 cents works on futures and 27 cents, local warehouse, on spot. Demand in both instances is slack.

Coke Oven By-Product

Spot*

Per Gallon at Producers' Plants in Tank Lots	
Pure benzol	$0.25
Toluol	0.26
Solvent naphtha	0.25
Commercial xylol	0.26
Per Pound at Producers' Plants	
Phenol	0.27
Naphthalene flake	0.05½ to 0.07
Naphthalene balls	0.06½ to 0.07
Per 100 Pounds at Producers' Plants	
Sulphate of ammonia	$2.40 to $2.45
Contract	
Pure benzol	Nominal
Toluol	Nominal
Solvent naphtha	Nominal
Commercial xylol	Nominal
Per Pound at Producers' Plants	
Phenol	$0.25
Naphthalene flakes	Nominal
Naphthalene balls	Nominal

*Spot distillates are subject to shading.

Hardware Trade Benefits by Standardization

Washington, Aug. 19.—Benefits resulting to member industries of the American Hardware Manufacturers' association through the elimination of excess varieties, models, sizes or types of their commodities, brought about with the co-operation of the division of simplified practice, department of commerce, have caused inquiries from still other industries through the association, it was stated today at the division.

Manufacturers of horseshoes, one of whom alone makes more than 900 varieties and sizes, have asked for information as to how reductions may be made in the interests of greater efficiency, greater labor stability, and better service. Makers of forged wrenches, discovering that a wide range of finishes and sizes of that product are being offered for sale, are investigating to see what eliminations can be made in the interest of greater economy.

Southern hardware jobbers, reflecting the attitude of the retail hardware men, have suggested that there is need for simplification of the varieties of finishes, widths, and types of wire cloth. The division is taking up the subject with the manufacturers and with other distributing and consuming interests.

The vast range of sizes, finishes and types of oil cans in another subject brought to the attention of the division, which, in co-operation with the hardware manufacturers association, is studying whether fewer varieties would not do as well, with general benefits to manufacturer, distributor, retailer and user.

Few Accidents Reported

Statistics prepared by the American Sheet & Tin Plate Co. for the month of June show that operations were conducted at the Dover, Chester, Crescent, Pennsylvania, Wood and Old Meadow works without a single lost-time accident. During the same month only one lost-time accident was reported at each of the following plants: Cambridge, Guernsey, Leechburg, National, New Castle, Sabraton, Vandergrift and Gary Sheet works.

Plan Noon Talks by Radio

Chicago, Aug. 19.—Representatives of the Western Electric Co., Westinghouse Electric & Mfg. Co., Western Cartridge Co., Deere & Co., and the St. Louis and Alton Manufacturers' associations met recently with the Illinois Manufacturers' association to consider the use of radio for factory talks. Through noonday programs it is thought that 800,000 workers in Illinois can be instructed in the salient facts of Americanization, safety, thrift, legislative and other movements. The programs would be broadcast between 12 and 12:30 every day by the Illinois association, the manufacturers to install receiving sets in their plants.

Complaint Made Against Wheel Company

Washington, Aug. 19.—Acquiring the whole of the capital stock of a competing company with the effect of substantially lessening competition and creating a monopoly in the automobile wheel industry is charged by the federal trade commission in a citation directed to the Motor Wheel Corp. of Lansing, Mich. The firm manufactures and sells wood wheels and steel disc wheels for automobiles and sundry parts and materials for automobiles and automobile wheels.

The complaint alleges that the corporation acquired the stock of Forsythe Bros. Co., Harvey, Ill., manufacturer of steel disc automobile wheels. Such acquisition, the complaint states, is a violation of the Clayton act in that it has a tendency to restrain commerce in the sale of steel disc wheels in the sections in which the companies sold their products.

Finland Plans Drydock

Washington, Aug. 19.—Construction of a large drydock at the mouth of the Aura river in Finland has been planned at an estimated cost of 25,000,000 to 30,000,000 Finnish marks, the United States department of commerce is informed. The proposed dock can be used in all seasons.

Steel Scrap More Active

(*Concluded from Page* 452)

would be in the market for any supplies. The opinion prevailed that stocks at mills were sufficient for any liberal bookings in the next few months. There is no scarcity of scrap in this market.

Heavy Melt Up 50 Cents

New York, Aug. 19.—An increase of 50 cents in heavy melting steel for eastern Pennsylvania delivery, features the local scrap market. Substantial tonnages in at least two instances, have been placed at $17, delivered. As a matter of fact, the market generally is showing increased strength and on several grades prices have been advanced, the increases ranging from 50 cents to $1 a ton. Among the items affected are rails for rolling, turnings, old steel shafting, No. 1 railroad steel, and heavy melting steel. The wrought and cast grades are unchanged.

Market Continues Sluggish

Cincinnati, Aug. 18.—What support the iron and steel scrap market possesses in this district is furnished by dealers. They are buying for their yards and are willing to pay the quoted market levels. At the same time they are refusing to be tempted by the low offers that some consumers are making on the small quantities they are willing to buy. However, the market continues sluggish, despite the encouraging reports to the effect that prices have strengthened slightly in other districts. Prices are nominal because there is not enough business being transacted to establish representative market quotations. Generally speaking, mills in this district are taking only what material they actually need. Recent dispositions by railroads developed some attractive prices from their standpoint, the bulk of the scrap being bought for dealers' yards. The Louisville & Nashville railroad is in the market with a list aggregating several thousand tons of miscellaneous scrap.

Buying Limited, Inquiry Lacking

Cleveland, Aug. 19.—Iron and steel scrap sales in this district are extremely limited and inquiries from consuming interests are almost wholly lacking. Prices have undergone little or no change during the past week.

Sales Few But Prices Steady

St. Louis, Aug. 18.—Purchasing of scrap iron and steel by consumers is not impressive but there is good strength to the market, and throughout the list prices are steady to 50 cents higher. Melters' stocks are not large. During the past two or three weeks the mills have been quietly casting about for bargains, but are not willing to pay prices asked by dealers. Cast grades are in better demand, reflecting better business with the gray casting people and stove manufacturers. Rails for rerolling are receiving more attention, with supplies scarce and the demand more active. Steel specialties continue strong, short rails and angle bars having been marked up fractionally. Old car wheels are higher by 50 cents per ton, and some inquiry for this material has developed from other consuming points. Rolling mill items, which had been the slow spot in the list for more than three weeks, are exhibiting slightly more life, and there continues a good demand for all material suitable for blast furnace use. As yet the movement from the country remains at a standstill, but there are liberal accumulations at points which ship to this market, and any further advance in prices would doubtless result in this scrap moving. The railroads are engaged in moving crops and are marketing less scrap than heretofore. The only lists reported were 500 tons by the St. Louis & San Francisco, 100 tons by the New Orleans & Great Northern and 2600 tons by the Rock Island.

Anticipate Continued Improvement

Birmingham, Ala., Aug. 18.—Improvement in the scrap iron and steel market in the Birmingham district continues so far as steel scrap is concerned and advanced quotations are announced. Old material levels are not fluctuating much because of the low prices obtaining in pig iron but the heavy melting steel and old steel rails are now up to $12.50 and some little demand is felt with inquiries coming in hand which would indicate there will be some business placed before long. The purchasing of stock again by dealers indicates that there are anticipations of an improvement in the trade before long.

Germans Better Position in Spanish Market

Washington, Aug. 19.—By an exchange of tariff concessions between Spain and Germany, German products now are placed on a level of substantial equality with competing countries in the matter of costs of admission into Spain, whereas German products formerly were subject to the handicap of the depreciated currency surtax which increased the duties by about 80 per cent. The German products also were denied the benefits of such conventional duties as had been established by treaties with other nations.

The reductions in the former Spanish import duties on many German products and important concessions in the German duties on characteristic Spanish products were provided in a temporary commercial arrangement between Spain and Germany made in Madrid, effective as of Aug. 1, according to cabled advices to the United States department of commerce from Assistant Trade Commissioner Burke, at Madrid.

In return for this improved competitive position of German suppliers in the Spanish market, particularly in the trade in machinery, machine tools, and chemicals, Germany grants more favorable rates of admission into its markets for a number of important Spanish products. The principal Spanish commodities affected are fruits, vegetables, cork and certain industrial raw materials.

The concessions in the German duties granted to Spain also are extended, by virtue of existing treaty relations, to similar products from the United States. The few new conventional rates granted by Spain to Germany are not, however, extended to similar American products now, although the principal effect of the arrangement is to place German and American manufactured goods on substantially the same tariff level in the Spanish market.

Sell Less to Canada

Washington, Aug. 19.—Canada bought considerably more tin plate from the United States in the fiscal year just ended than in the preceding year, and exports of iron and steel plates from this country into the Dominion also gained slightly, while iron and steel sheets decreased, according to analysis of United States trade with Canada compiled by the department of commerce. The analysis shows that exports to Canada, valued at $601,500,000 in the last fiscal year, declined 9 per cent from the previous year, this decline being spread over nearly all classifications. Exports of iron and steel plates gained from $5,100,000 in 1923 to $5,100,000 in 1923 to $5,300,000 in 1924. Iron and steel sheets decreased from $8,600,000 to $6,000,000 in value. Canada took $3,500,000 worth of tinplate in 1924, compared with $2,700,000 worth in 1923.

Refined copper exports were valued at $3,80,000 in 1924 and $1,600,000 in 1923. Copper ingots exported into Canada in 1924 totaled $1,900,000 and $3,800,000 in 1923.

Among imports into the United States from Canada were copper ore, concentrates and matte, which increased from $700,000 in 1923 to $4,300,000 in 1924. Crude copper declined, however, the total being $6,600,000 in 1924, compared with $7,600,000 in 1923. During the fiscal year, the United States bought from Canada total goods to the value of $417,000,000, an increase of 1 per cent over last year, giving the United States a favorable balance of trade of $134,000,000 for the year.

Canadians To Build Bridge

Washington, Aug. 19.—Montreal harbor commission has been granted authority to build a bridge from the Island of Montreal to St. Helen's island in the harbor and thence to the south shore of the St. Lawrence river, beginning at Delorimier avenue, in Montreal, according to a report to the department of commerce from Consul General Albert Halstead, of Montreal. Several thousand tons of steel will be used. Plans have not been accepted, although it is reported the contract for the work will go to Canadian construction companies.

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Meet To Form New Rates On Cast Iron Pipe

Birmingham, Ala., Aug. 19.—Cast iron pipe interests of the south met last week with the general advisory committee of the fourth section board of the southern carriers in Atlanta to try to build up a rate on cast iron pipe shipments from various points of production. An agreement on cast iron pipe rates to points in the south, Ohio river crossings and eastern and interior eastern points, including the Virginia cities is sought. Revisions which are taking place in the class rates as well as the rates on other special iron articles will necessitate a revision of the rates on cast iron pipe. This revision is also being necessitated by continuous denial by the interstate commerce commission of the fourth section. Several conferences among the cast iron pipe producers have been held in the past in an effort to agree on the basis which will be satisfactory to all producing points. E. M. Cole, traffic manager of the American Cast Iron Pipe Co., is chairman of the committee for the shippers handling the proposition. The rate committee, of which Mr. Cole is also chairman, is made up as follows: A. J. Ribe, traffic manager; N. J. Maloney, Central Iron & Coal Co., Holt, Ala.; N. A. Clark, Central Iron & Coal Co.; J. W. Stanfiel, Stockham Pipe & Fittings Co.; R. A. McCaffrey, United States Cast Iron Pipe & Founders Co.; E. Del Wood, secretary, Chattanooga Manufacturers association, Chattanooga; D. W. Blodsoe, manager Anniston traffic bureau; C. E. Jones, secretary, Birmingham traffic association.

Tunnel To Be Built

New York, Aug. 19.—Contract for the erection of a proposed $30,000,000 passenger and freight tunnel between Brooklyn and Staten Island will be let shortly after Jan. 1. This was announced recently by Mayor Hylan in a statement in which he said that reports that the project was to be abandoned were not true. The whole matter hinged, he said upon the city's debt limit. He appealed for exemption of $275,000,000 for subway purposes in New York City. He insisted, however, that the tunnel would be built even if the desired exemption were not granted.

The Business Trend

August 21, 1924

BY JOHN W. HILL, FINANCIAL EDITOR

MUCH has been said recently about improvement in business sentiment and in the outlook. Unimpeachable evidence is now appearing that trade itself actually is on the mend.

Commodity prices have turned definitely upward. Operations in the steel and automobile industries are slowly expanding. The volume of industrial building proposals is swelling. Copper, leather, rubber and numerous other lines also are feeling the impulse of betterment. Moreover, freight movements are gaining. In the week ended Aug. 2 the number of carloadings was 945,731. That was the highest total of the year, and it showed a smaller decline from the same week of 1923, than previous weeks have shown.

The great forces of propulsion behind the advance in business are four in number. They include the ease of money, the dramatic rise of grain prices, the European settlement, and the smaller stocks of goods in many lines, resulting from enormously curtailed outputs.

Grain Moves Higher

Agricultural joys are multiplying. Corn and wheat have leaped still higher, touching new tops. Corn is up almost 70 per cent from the year's low and wheat is up nearly 40 per cent. The corn crop probably will show a smaller yield than in 1923, but the cash value should be larger.

The wheat harvest is proving unexpectedly abundant in many sections. It is being marketed and the cash used to thaw frozen debts and stimulate trade. The world wheat crop shows a loss of 13 per cent, Canada's crop alone declining nearly 200,000,000 bushels from last year.

Money Rates Decline

Money rates have indulged in another precipitate drop. Commercial paper at 2¾ per cent at New York is the lowest since 1915. Vast sums of idle money are seeking employment and some degree of credit inflation may result. One indication of this is already seen in soaring security values.

Reviving trade will benefit from the stimulation of easy money but an overexpansion of loans would not be favorable. This may be held in check to some extent, by the outflow of gold and credit to Europe.

The London agreement just reached for the inauguration of the Dawes plan gives promise of rehabilitation abroad. That will provide a basis for the extension of loans by the United States, a forerunner of increased sales of American food and raw materials.

Later on European goods may compete with American ones but there is less to fear from a prosperous than from a prostrate Europe. The approaching return of a more normal world balance is seen in the July record of foreign trade, showing a slight excess of imports for the first time in over a year and smaller gold imports.

The Barometer of Business

Weekly Comparison

	Last week	Week before	One mo. ago	One year ago	1913
Business failures ..	366	329	365	348	...
Cash ratio Fed. Res. System %..	82.5	82.5	82.6	77.3	...
Loan Rate, 4-6 mos. N. Y. %..	3¼	3½	3¼	5	6
Aver. 25 industrial shares	$119.88	$117.81	$113.29	$102.95	$58.19
Aver. 25 railroad shares	$72.09	$70.51	$68.94	$56.24	$82.97
Aver. 40 bonds ..	$81.35	$81.20	$81.41	.....	$93.00
Car loadings week ended Aug. 2 ..	945,731	925,859	759,942	1,033,130	*935,730
Bank debits 240 cities (000 omitted)	$9,392,582	$10,120,235	8,249,329	$7,376,327	

*1920

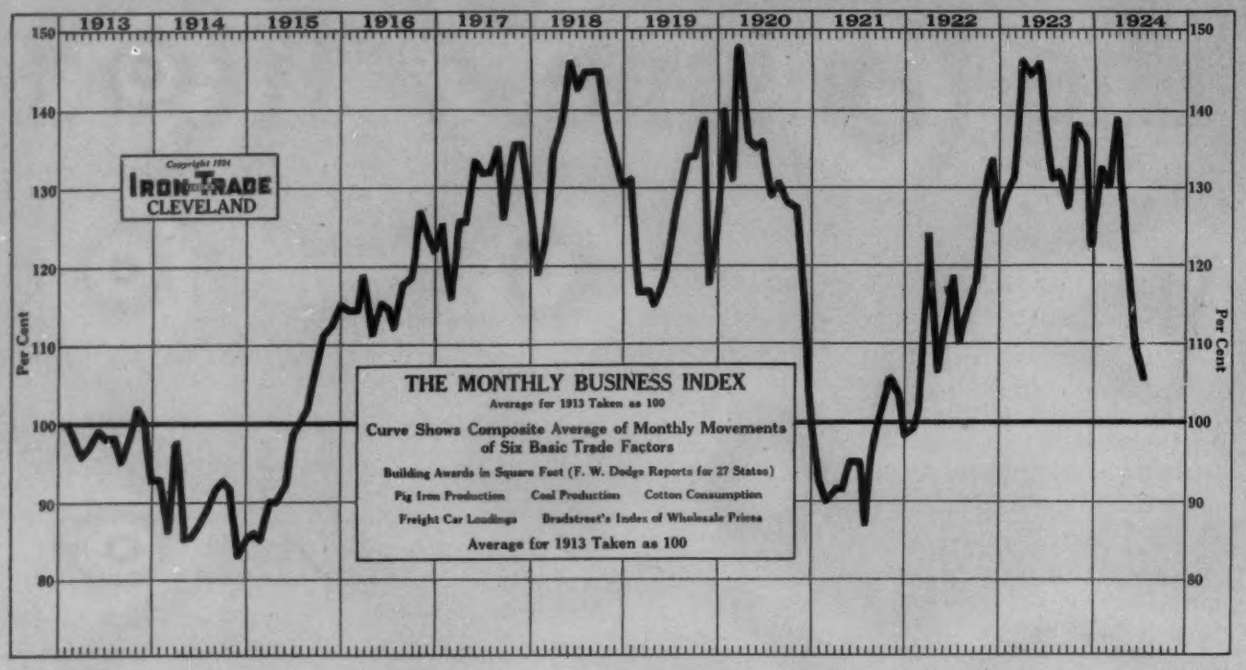
Foreign Exchange (Demand)

	Normal	Last week close	One week before	One month ago	One year ago
Sterling	$4.86	$4.55	$4.52	$4.37	$4.55
Francs	19.3c	5.69c	5.52c	5.12c	5.52c
Lira	19.3c	4.52c	4.48c	4.31c	4.29c

Monthly Comparison

	July	One Month before	One Year ago	1913 Mo. average
Dodge Building awards in 27 states (sq. ft.)	41,178,800	48,064,100	42,573,400	31,250,000
Business failures: Number	1,615	1,607	1,231	1,336
Liabilities ..	$36,813,238	$34,099,031	$35,700,000	$22,732,000
Exports	$278,000,000	$306,982,000	$302,186,000	$233,195,000
Excess of gold imports	$18,507,000	$24,913,000	$27,906,000	†$630,716
Bureau of labor price index ..	147	144.6	150.6	100
Bradstreet's price index	136.5	132.2	138.7	100
Economist's British price index	171.4	166.7	154	100
Nat'l Industrial Con. board living cost index	*161.7	161.4	160.1	‡100
New incorporations	$572,195,750	$455.022,400	$724,920,000	$49,301,000
Railroad net earnings	*$65,528,000	$60,595,000	$88,287,500	$59,301,000

†Excess of gold exports. ‡July, 1914. *June.

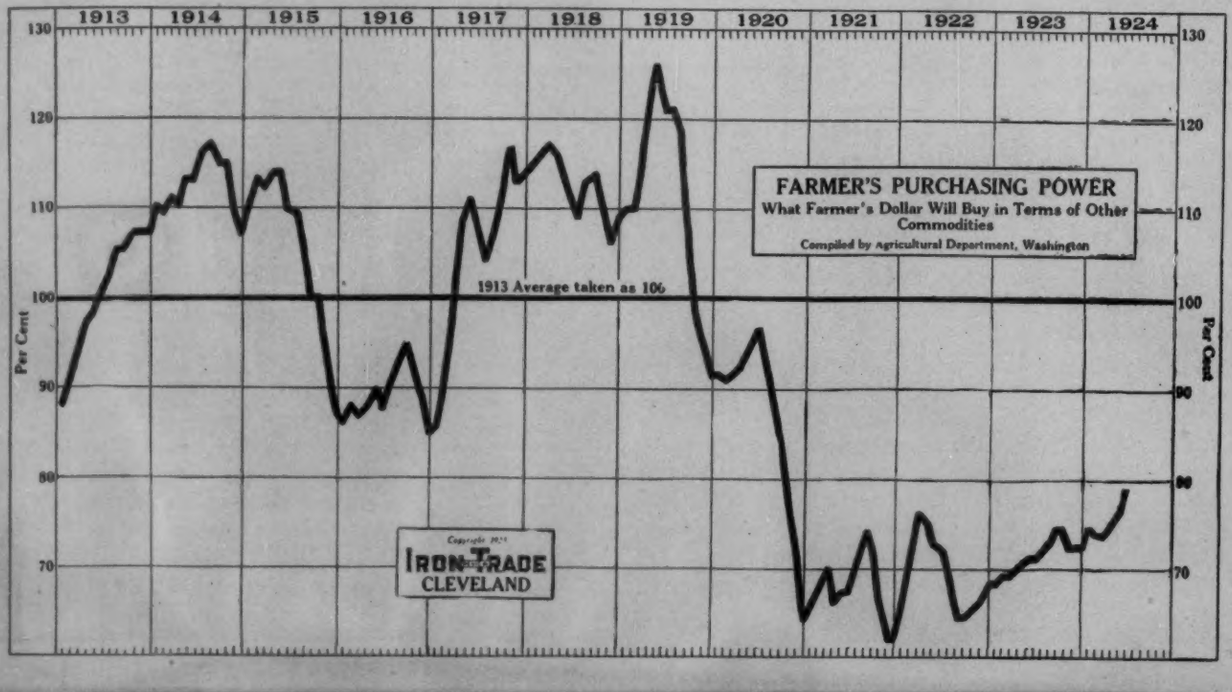


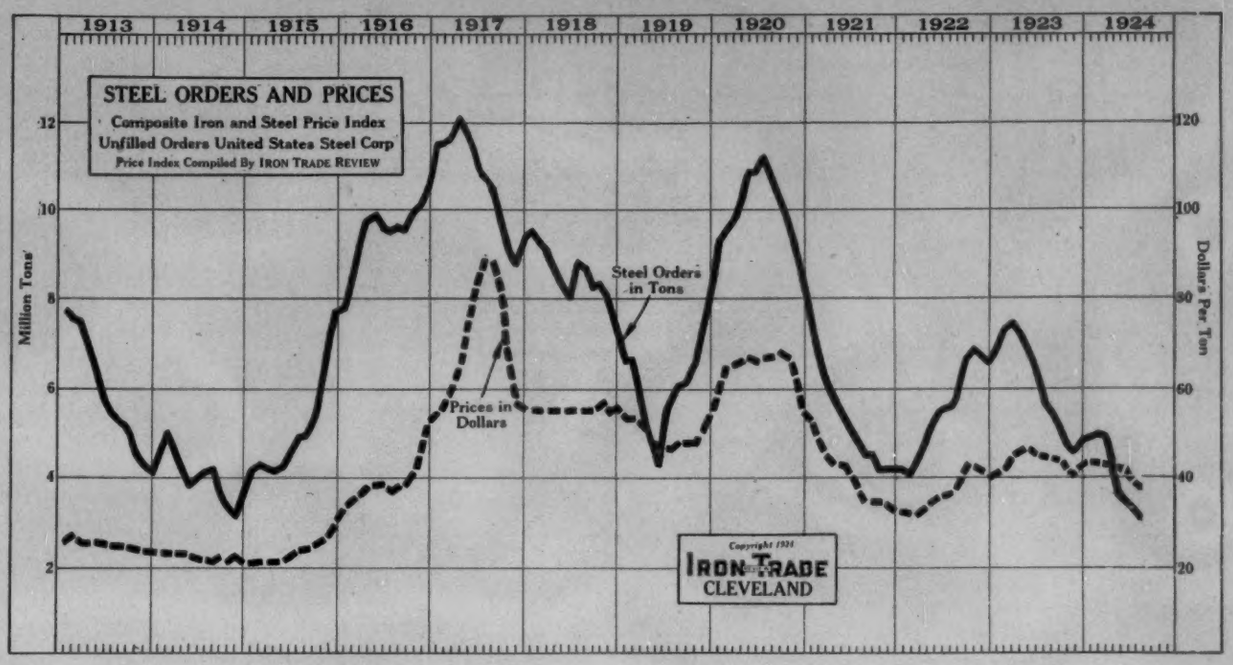
Business Index

THE IRON TRADE REVIEW Monthly Business Index declined to 105.5 in July, compared with 109.4 in June. This was the lowest level touched since February, 1922. The decline in July was the smallest of any month since the recession began in April. Indications that the low point is at hand are seen in the fact that in July three of the factors comprising the number, traffic, coal output and prices advanced. The remaining three, pig iron output, building and cotton consumption declined.

Farmer Purchasing Power

FOR the first time in half a decade the farmer is beginning to taste the golden cup of prosperity. His purchasing power is rising as the prices of grain, livestock and other products increase. As computed by the agricultural department the purchasing power of farm products was 79 per cent of the 1913 average in June, the highest since 1920, and the July number is expected to bring a much wider gain. Based on present prices a gain of 19 per cent or nearly $2,000,000,000 in crop values is indicated for 1924.



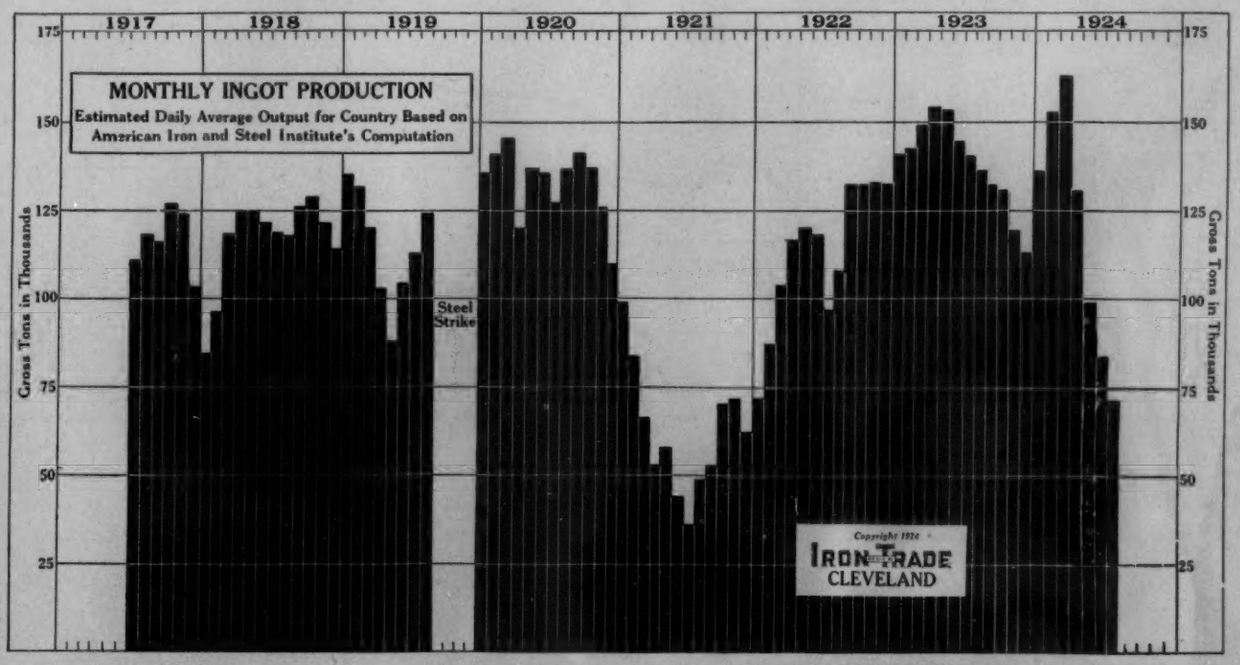


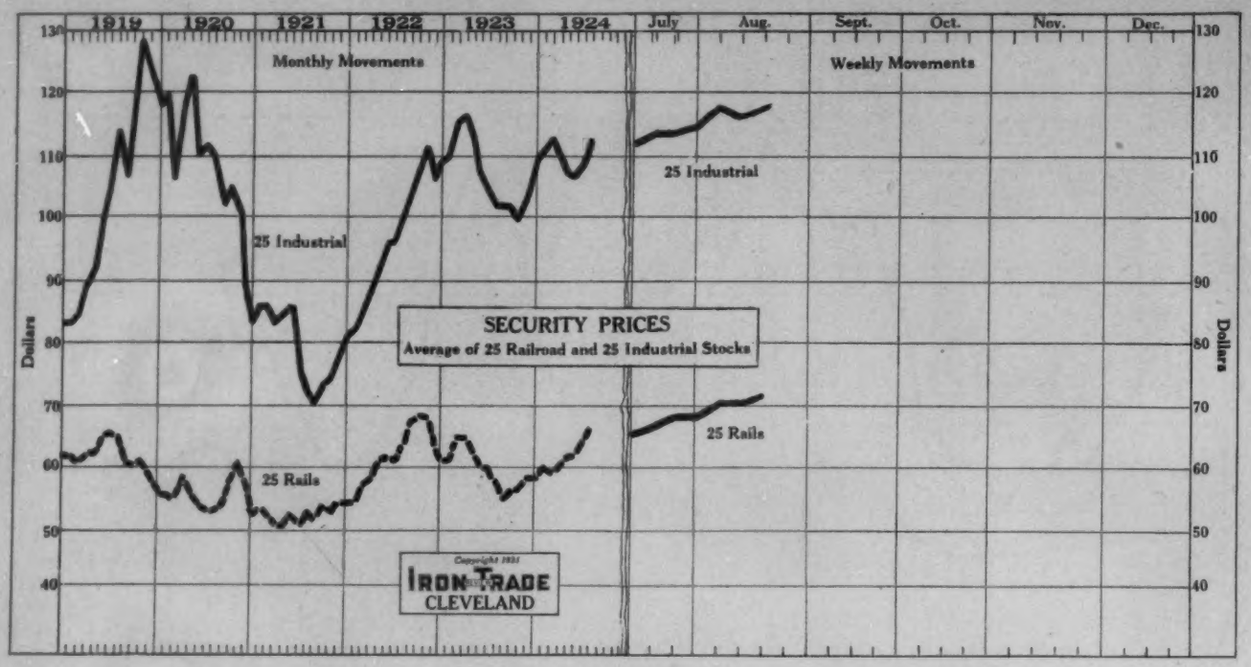
Unfilled Orders

UNFILLED tonnage of the United States Steel Corp. as reported for July 31 totaled 3,187,072 tons. This was a decline of 75,433 tons, the smallest since the recession last March. It compares with a decline of 365,584 tons in June and with an average drop of 412,000 tons during the four months from March through June. The total, last reported, is the smallest since May, 1911. Close piecemeal buying that has prevailed is reflected. The steel price average continues weak, though pig iron is up a trifle.

Ingot Production

PRESENT indications are that July brought the extreme bottom of the depression in the iron and steel industry. During that month the daily average output of steel ingots fell to 71,901 tons, the lowest level since December, 1921. The July production rate represented a decline of 55 per cent from the lofty peak of 161,075 tons daily average attained in March. It was, however, double the extreme bottom of 36,700 tons touched at the trough of the major reaction of three years ago.



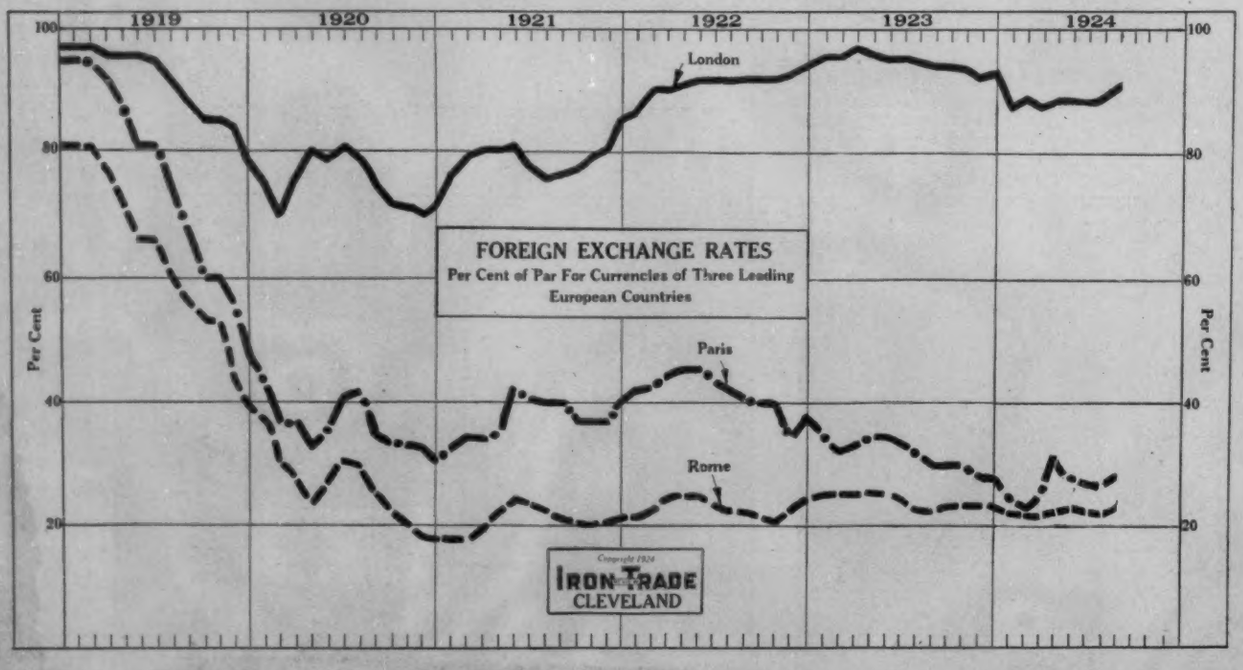


Security Prices

THE security market has moved forward in an important advance. Early in August the average for 25 industrials reached 119.59. This surpassed the peak for 1923 and was the highest point reached since the spring of 1920. The high point of the 1919 bull market was 138 for 25 industrials. Twenty-five rail shares also have touched a new top at 71.14, the highest since 1917. The lull of last week has been succeeded by renewed activity, due partly to the influence of cheap money and new peaks have been established.

Foreign Exchange Rates

THE recent upward swing of leading European exchanges is partly explained by the improved outlook abroad. Indications that the Dawes plan will speedily be put into operation has raised hopes of rehabilitated financial and economic conditions in Europe. Sterling's advance has been most striking, rising to the highest level since early in 1923 and a return to par seems probable. Low American money rates have aided sterling by causing capital to flow to London where interest rates are higher.



Current Statistics of Industry

River Traffic in Steel Drops During July

Pittsburgh, Aug. 19.—Statistics recently issued by the United States engineers' office show a substantial increase in the movement of steel products on the Allegheny and Monongahela divisions. A slight drop in the shipment of steel products over the Ohio river makes a total decrease. During July, 3972 tons of steel products moved over the Allegheny river, as compared with 1098 tons in June. The movement on the Monongahela river last month was 11,623 tons, which compares with 10,601 tons during the month previous. Steel products shipped on the Ohio river for July totaled 12,385 tons and for June, 16,517 tons, a drop of 4132 tons. Shipments of miscellaneous products for July, including coal, coke, gasoline, gravel, packet cargo, sand, steel products, and unclassified commodities, totaled 301,132 tons over the Allegheny river, 1,536,808 tons over the Monongahela, and 439,861 tons over the Ohio river. Detailed tonnage figures of steel products shipped over the three rivers from January, 1923 to July, 1924, follow:

	Allegheny river	Monongahela river	Ohio river
July	3,972	11,623	12,385
June	1,098	10,601	16,517
May	3,857	16,665	14,343
April	17,190	33,740	21,600
March	21,286	29,951	24,610
February	....	27,005	23,668
January, 1924	....	15,700	11,050
December	485	13,460	35,420
November	304	11,980	12,450
October	....	20,425	9,755
September	....	18,256	11,390
August	....	34,590	20,922
July	100	36,827	16,335
June	75	44,791	21,558
May	....	25,910	21,200
April	100	21,825	20,800
March	....	17,291	16,191
February	....	19,337	3,285
January, 1923	....	26,997	1,030

Steel Castings Output Drops in July

Washington, Aug. 19.—A decline of 11.3 per cent of shop capacity producing steel castings was registered in July, with a total output of but 37,339 tons as compared with 48,718 tons in June, according to returns to the department of commerce from manufacturers representing over two-thirds of the commercial castings capacity of the United States. Most of the loss in tonnage occurred in railway specialties, this classification falling from 26,170 tons in June to 15,761 tons in July. This represents the fifth consecutive monthly decline from the high point of 59,778 tons of railway specialties produced in March. The following table shows the bookings of commercial steel castings by 70 identical companies with a monthly capacity of 100,700 tons, of which 39,100 tons usually is devoted to railway specialties and 61,600 to miscellaneous castings.

	Total net tons	Per cent capacity	Railway specialties net tons	Miscellaneous net tons
1923 totals	867,563	...	380,000	487,563
Mo. av. ..	72,335	74.6	31,667	40,668
1924				
January ..	51,406	51.0	19,572	31,834
February ..	73,138	72.6	35,474	37,664
March ...	100,514	99.8	59,778	40,736
*April ...	67,806	67.3	33,151	34,655
**May	56,581	56.2	28,064	28,517
June	48,718	48.4	26,170	22,548
July	37,339	37.1	15,761	21,578

*Two companies with a capacity of 785 tons per month on miscellaneous castings now out of business.

**Reports missing from one small company on miscellaneous castings.

Stoker Bookings Gain

Washington, Aug. 19.—July sales of mechanical stokers, totaling 115, was the highest monthly figure since August, 1924, and compares with 102 for June, and 64 for May, according to figures of the department of commerce. Of the July total 14 were for fire tube boilers and 101 for water tube. Folowing are comparisons of sales:

1924	Stokers sold	Fire tube boilers	Water tube boilers
January	91	7	84
February	110	11	99
March	89	12	77
April	89	15	74
May	64	3	61
June	102	19	83
July	115	14	101
1923			
January	145	29	116
February	129	9	120
March	120	9	111
April	167	14	153
May	194	14	180
June	135	6	129
July	129	21	108
August	135	18	117
September	99	16	83
October	88	14	74
November	50	10	40
December	73	17	56
Total 1923	1,464	177	1,287

Tin Plate Exports Larger

Washington, Aug. 19.—Exports of tin plate and terne plate from the Swansea, Wales, consular district in the first six months of 1924 amounted to 200,421 long tons, as compared with 183,015 tons in the corresponding period of 1923, according to a report to the department of commerce. Notable increases were made in shipments to Australia, Canada, China, Japan, Norway, Portugal, South America and Spain. Exports of black plates decreased from 74,076 tons for the first six months of 1923 to 64,977 tons for the corresponding period of 1924.

Furniture Shipments Drop

Washington, Aug. 19.—Shipments of steel furniture totaled $1,115,792 in July as compared with $1,270,615 in June and $1,505,367 in May, according to figures of the department of commerce based on returns by 22 manufacturers. The July figure represents the fifth consecutive monthly decline. Following are comparisons of shipments since January, 1922.

	1922	1923	1924
January	$983,834	$1,362,470	$1,592,338
February	967,125	1,307,173	1,605,409
March	1,087,228	1,709,206	1,661,303
April	1,058,382	1,520,286	1,658,610
May	1,056,735	1,506,072	1,505,367
June	1,015,463	1,401,950	1,270,615
July	945,768	1,247,605	1,115,792
August	943,087	1,345,147	.....
September	1,062,495	1,273,259	.....
October	1,227,447	1,365,600	.....
November	1,204,310	1,339,425	.....
December	1,376,152	1,455,836	.....

Complains of Unfairness

Washington, Aug. 19.—In a complaint issued by the federal trade commission, the Banner Foundry & Furnace Co. and P. T. McGuckian, William A. Garber and C. Ed. Smith Jr., of Akron, O., officers of the concern, are charged with unfairly obtaining the business of a competitor. The citation states that the respondents, McGuckian and Garber, were officers and active in the conduct of the business affairs of the Twentieth Century Heating & Ventilating Co., one of the competitors of the company cited. The complaint alleges that these respondents, by reason of their official positions with the alleged competing company, obtained patterns and castings and used them in the production of their goods.

Wheeling Reports Loss

The Wheeling Steel Corp., Wheeling, W. Va., reports net loss for the three months ended June 30, 1924, amounting to $170,986, after allowing for depreciation and interest. The consolidated income account for the quarter follows:

Total income*	$ 997,029
Depreciation	780,716
Exhaustion of minerals	17,648
Interest	369,650
Net loss	170,985
Profit and loss surplus	$7,002,547

*After provisions for repairs and maintenance.

German Competition Is Feared

Belgians Oppose Proposed Settlement, Seeing Disastrous Competition—Business on Continent Slowing Up—German Exports for Half Year Show a Decline—Seven-thousand British Steelworkers Strike

Iron Trade Review Staff Cable

European Headquarters,
IRON TRADE REVIEW,
2-3 Caxton House, Westminster, S. W.1

LONDON, Aug. 18.—The iron and steel business in Belgium is nearly at a standstill, pending the result of the London interallied conference. It is reported that Belgians are averse to the proposed settlement, fearing disastrous German competition.

Belgian exports to England have been checked by a rise in the value of the franc. At the same time, the English trade is quiet, and the pig iron situation weaker, although the markets for galvanized sheets and tin plate are expanding.

British exports of iron and steel in July totaled 347,799 tons, an increase from 324,432 tons in June, and compared with a monthly average of 355,000 tons in 1923. Imports in July amounted to 247,154 tons, compared with 175,476 tons in June and the monthly average of 111,000 tons in 1923. Germany's iron and steel exports in the first half of 1924 total 749,487 tons, in contrast with 969,291 tons in the same period last year. Further information from Germany today is that sales and plant operations are showing continued reduction.

The Union of South Africa railways have ordered 72 boilers on the Continent, most of them in Germany, while placing an order for 22 in Great Britain. Agents for the crown colonies have ordered 18 locomotives from the Vulcan Foundry, Lancashire. Belgians have obtained a contract from Chile for locomotives to the value of £4700 ($21,197) (against a British bid of £9260 ($41,762).

Seven thousand steelworkers in Sheffield went on strike today, resisting a proposed sliding scale on the ground that it provides a reduction of 7 shillings ($1.57) for helpers. Three companies are affected, having a combined weekly capacity of 20,000 tons of steel.

British Feel Stronger Belgian Competition

European Staff Special

Office of IRON TRADE REVIEW,
Prince's Chambers, Corporation St.

BIRMINGHAM, Eng. Aug. 7.—Slightly lower franc values have sharpened Belgian competition. Export trade at Middlesbrough is dull, the present prices of continental pig iron being well below British figures. No. 3 G. M. B. can be bought at £4 6s ($18.92) and east coast hematite at £4 14s ($20.68). Stocks are growing in all districts. The slow state of engineering severely restricts the demand for foundry iron.

Barrow-in-Furness is still satisfied with its 12 active furnaces and stocks are accumulating to a disquieting extent. The reduction in ferromanganese has brought no noticeable revival, America being a poor customer. Forge iron is hardly called for at all, but no great quantity of this material is now being made. Indian pig iron is offered here, but at present is slightly dearer than Scotch iron, which in character it generally resembles.

A curious development in the steel trade is the placing by the Hull trammays committee of an order for 1000 tons of tram rails with Bolckow, Vaughan & Co., Ltd., Middlesbrough, although the price was quoted as £12,291 against £10,178 quoted by the Anglo-Belgian Improvement Corp., Brussels, and a German syndicate £9957. The order includes 24 tons of fishplates and 14½ tons of sole plates. The Middlesbrough firm made a strong appeal for the order, on the ground that the Germans work 60 hours per week against 40 hours in this country and that the German wage is about £1 10s ($6.60) per week. On the offer by Bolckow, Vaughan to reduce the

Sterling—$4.40

price by £1 ($4.40) per ton if the contract was increased to 1500 tons the corporation accepted this.

Steelworks generally will be closed throughout the August bank holiday and the stoppage may be extended. The resumed operations in Scotland, after the usual summer stoppage, may bring a little demand for shipbuilding material. The steel works have generally operated this week, with comprehensive rolling lists indicating cleaning up operations. Prices of steel are comparatively firm, makers not being inclined to increase their losses. Billets cost as a minimum £7 10s ($33) delivered, and bars, angles, joists, etc., are about £9 10s ($41.80) on the same basis.

Against these figures some remarkably low Belgian quotations originating in the Charleroi market were received in Birmingham yesterday. Merchant bars are quoted £6 6s 3d ($27.78), joists £5 18s 9d ($26.08) and plates 3/16-inch thick, £7 12s 6d ($33.55) all f.o.b. Antwerp. Another quotation telegraphed to Birmingham offers joists £6 ($26.40) f.o.b. Antwerp. This would be equal to £7 3s ($31.46) delivered, against the English figure of £9 10s ($41.80). On this basis 500 tons is offered, the products being subject to British standard specifications. It is considered that an outside shading of English prices for joists might bring them down to £9 7s 6d ($41.25) delivered. It is obvious that for foreign destinations British merchants can sell this material profitably direct from Antwerp, and although there is no means of testing this class of tonnage British steelworks must be losing a lot of business in this way.

Some significance is attached to the new policy of many steelworks in retaining their steel scrap instead of putting it on the market. Their explanation is that they consider, later in the year they can use the material more profitably in their own melting furnaces. This steel sells very slowly, the prevailing figure of £4 ($17.60) delivered not being attractive.

The Staffordshire iron trade which is fighting for life has to face another increase of 2½ per cent in wages as the result of the wage board ascertainment of selling prices during May and June, the value being higher by about 7s ($1.54) per ton. This makes the wage increase since the beginning of the year 10 per cent and 65 per cent over the base rate of 13s 6d ($2.97) for puddling. The high selling price is a serious obstacle to the sale of this product, which although admittedly high class cannot compete with steel costing at least £3 ($13.20) less per ton. For medium bars, the price continues at £13 ($57.20). South Yorkshire, however, has advanced to £13 10s ($59.0).

Staffordshire nut and bolt iron costing £12 ($52.80) competes very unfavorably with Belgian No. 3 iron seling delivered here at £8 ($35.20). The nut and bolt trade is depressed, and is not at present absorbing much iron. The fencing trade is also decidedly slow.

The tin plate trade continues brisk with an upward tendency, production now being about 90 per cent of capac-

Current Iron and Steel Prices of Europe

Prices Converted into Dollars at Rates of Exchange, August 18

	British Gross Tons U. K. Ports		*French* Metric Tons Channel Ports		*Belgian and Luxemburg* Metric Tons Channel Ports		*German* Metric Tons Rotterdam or North Sea Ports	
Export Prices f. o. b. Ship at Port of Despatch—By Cable	£ s d			Francs		Francs	£ s d	
PIG IRON								
Foundry No. 3, Silicon 2.50-3.00	$19.62	4 7 0*	$17.75	325	$17.68	350	$21.54	4 15 6
Basic	18.04	4 0 0	18.29	335	17.17	340	24.58	5 9 0
Basic-bessemer	21.99	4 17 6	17.47	320	16.92	335	21.54	4 15 6
Hematite, Phosphorus 0.02-0.05	20.97	4 13 0	23.48	430	.....	....	25.93	5 15 0
SEMIFINISHED STEEL								
Billets	$31.57	7 0 0	$25.12	460	$25.25	500	$27.06	6 0 0
Wire rods	49.61	11 0 0	36.04	660	33.58	665	31.01	6 17 6
FINISHED STEEL								
Standard rails	$38.34	8 10 0	$22.55	500	$30.30	600	$28.19	6 5 0
Merchant bars	1.76c	8 15 0	1.39c	560	1.27c	555	1.23c	6 0 0
Structural shapes	1.61c	8 0 0	1.29c	520	1.25c	545	1.23c	6 0 0
Plates, ship, bridge and tank	1.81c	9 0 0	1.71c	690	1.52c	665	1.30c	6 7 6
Sheets, black, 24 gage	2.62c	13 0 0	2.85c	1,150	2.86c	1,250	2.45c	12 0 0
Sheets, galvanized, 24 gage, corrugated	3.77c	18 15 0	4.38c	1,770	5.15c	2,250	4.50c	22 0 0
Bands and strips	2.21c	11 0 0	1.98c	800	1.83c	800	1.64c	8 0 0
Plain wire, base	2.42c	12 0 0	2.42c	975	2.29c	1,000	2.15c	10 10 0
Galvanized wire, base	3.12c	15 10 0	2.97c	1,200	2.86c	1,250	2.86c	14 0 0
Wire nails, base	2.92c	14 10 0	2.60c	1,050	2.40c	1,050	2.76c	13 10 0
Tin plate, base box 108 pounds	$5.19	1 3 0	.....	....	.....	....	$6.09	1 7 0

Domestic Prices at Works or Furnace—Last Reported							Renten Marks
Foundry No. 3 Pig Iron, Silicon 2.50—3.00	$19.62	4 7 0	$17.75	325(2)	$19.19	380	$21.16	92
Basic pig iron	18.04	4 0 0	15.83	290(1)	18.18	360	24.15	105
Furnace coke	4.51	1 0 0	7.92	145	7.83	155	6.21	27
Billets	31.57	7 0 0	25.12	460	26.51	525	21.85	95
Standard rails	1.71c	8 10 0	1.24c	500	1.37c	600	1.25c	120
Merchant bars	1.81c	9 0 0	1.46c	590	1.34c	585	1.20c	115
Shapes	1.81c	9 0 0	1.37c	555	1.32c	575	1.22c	117
Plates, ship, bridge and tank	1.91c	9 10 0	1.82c	735	1.65c	720	1.36c	130
Sheets, black, 24 gage	2.72c	13 10 0	2.85c	1,150	3.03c	1,325	2.29c	220
Sheets, galvanized 24 gage, corrugated	3.67c	18 5 0	4.33c	1,750	5.21c	2,275	4.17c	400
Plain wire	2.42c	12 0 0	2.55c	1,030	2.46c	1,075	1.67c	160
Bands and Strips	2.31c	11 10 0	2.01c	810	1.99c	870	1.67c	160

*Middlesbrough; †Scotch foundry iron; (1) Basic-bessemer; (2) Longwy. British export furnace coke £1 1s 0d ($4.74) f. o. b. Ferromanganese, £15 0s 0d ($67.65) f. o. b. The equivalent prices in American currency are in dollars per ton for pig iron, coke, semifinished steel and rails; finished steel is quoted in cents per pound and tin plate in dollars per box. British quotations are for basic open-hearth steel; French, Belgian, Luxemburg, and German are for basic-bessemer steel.

ity at least 10 per cent over pre-war production. Trade has been assistted by the firm value of tin, and as this is selling delivered here at £8 ($35.20) per ton more than when the present standard of £1 2s 7½ ($4.98) was fixed, few makers are willing to accept this figure. Most sales are about £1 3s ($5.06).

The galvanized sheet trade maintains its firmness, sales being at £18 5s ($80.30) to £18 10s ($81.40) with an especially good demand for 30-gage and other thin products. It now appears rather likely that the large order for the Argentine will go elsewhere owing to the filled up condition of British mills.

Evacuation May Affect Coke Trade

European Staff Special

Office of IRON TRADE REVIEW,
23 Rue de la Bienfaisance

PARIS, Aug. 8.—The much noted subject of the evacuation of the Ruhr is being closely followed by French metallurgists on account of its relation to the coke problem. Germany is delivering coke to France on the reparations account and receipts from this source are now ample for blast furnace requirements at the present rate of production. Some anxiety is felt over what will become of the stocks of coke which have accumulated at the cokeries in the Ruhr in case France decides to withdraw her troops from the region. The stocks have been built up as a reserve in an emergency but if France loses control of the railroads in the occupied territory the question arises as to what measures can be taken to assure the transport of this coke from the German producing plants to the French blast furnaces.

Franc—$0.045

Pig iron production for June amounted to 638,873 tons or approximately 20,000 tons less than during May. July production is also expected to show a falling off due to the slowing up of the demand in both the export and domestic markets. Foundry chill-cast No. 3 (2.50 to 3.00 silicon) is being maintained at 320 francs ($17.60) per metric ton. Hematite iron is still being quoted at 430 francs ($23.65) and a good volume of export business has been transacted at this figure. Little English hematite is entering France and no competition is anticipated from this source as long as the exchange remains at present levels.

French steel mills produced 554,921 tons of steel during June or a decrease of 44,000 tons as compared with May. The reconstruction of the great Micheville works in the East and the Denain and Anzin mills in the North is gradually nearing completion. Both plants have resumed the manufacture of semifinished steel products and their presence in the market is beginning to be felt by their competitors. Following are quotations which have been reported; basic bessemer ingots 390 francs ($21.45) blooms, 420 francs ($23.10); billets, 450 francs ($24.75), all per metric ton f.o.b. mill.

As is usual during this season of the year, makers of finished steel products are finding it difficult to keep their mills operating. The Saar mills have been offering keen competition of late and have succeeded in booking considerable tonnage for shipment into France.

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St. Louis as a Steel Center

DURING the past few years more than usual attention has been given to the advantages of St. Louis as an iron and steel producing center. Representatives of a number of the leading steel companies have investigated conditions in the Missouri city and its citizens have been particularly enthusiastic over its opportunities for future industrial expansion.

In view of this interest, IRON TRADE REVIEW some months ago undertook to make an impartial survey of the St. Louis district. The various factors affecting fuel, raw material, labor and market were analyzed carefully and a great mass of information bearing on the subject was collected. This data, obtained not only from the best sources in St. Louis but also from authorities in other sections of the country, has been boiled down and is presented in compact form elsewhere in this issue.

The survey shows that St. Louis unquestionably has important advantages in transportation facilities and in the cost of assembling raw materials. Its supplies of fuel, ore and secondary materials are abundant and accessible. It is quite evident that pig iron and steel can be made in this district at costs somewhat below the average of those prevailing in other producing centers.

With cheap products possible, the remaining factor is the capacity of the market. The westward trend of manufacturing and the rapid development of the Southwest are daily adding to the volume of the potential iron and steel market of the St. Louis district.

However the demand for various products is not well balanced and this fact causes producers to proceed cautiously. For this reason, spectacular expansion of steelmaking capacity in the district is not likely to occur immediately. Growth of production doubtless will be steady, and will be accomplished largely by natural extensions to existing works.

America Again at Inflation's Edge

THE long dormant specter of gold inflation is beginning to rise again in current economic discussions. Often predicted in recent years when the torrent of European gold began to flood the bank vaults of America, its failure to materialize led many to lay the idea upon the shelf of discarded and disproved economic theories. It has refused to remain permanently in that musty company, however. Some of the leading economists and banking authorities of the country now are convinced that America is beginning to taste the long withheld intoxicating cup of gold inflation.

They point to the spectacular advance of grain prices, the enormously increased activity of the security markets, the market rise in bank clearings, the upward turn of commodity prices, and, lastly, to the wave of business optimism which is now surging over the country. These things, it is maintained, are signs that the leaven of inflation is beginning to work. There is much ground for this view, although it is true that short grain crops, the European program of recuperation, and the tremendous curtailment of domestic industrial output and dwindling stocks of goods are all weighty factors in the turn of prices and trade.

Upon what is the gold inflation theory based? This country has imported $2,385,000,000 more gold than it has exported since 1915. We hold $4,500,000,000 of gold or fully one-half of the world's monetary gold stocks. The gold has been flowing in over many months, but it did not cause inflation previously because business conditions were unfavorable, and because the banks receiving the gold used it to pay off their indebtedness to the federal reserve system. About two months ago these debts were extinguished. As a result an immeasurable reservoir of credit has been created.

As a result, due to large gold hoards, the country has a supply of available credit far in excess of its current needs. Banks are anxious to get their resources employed and borrowers scenting improvement in the air are more willing to borrow money to buy securities, grain, commodities and

even to indulge in plans for business and trade expansion. These are the materials from which the spiral of inflation may well be constructed.

The fledgling of industrial revival will receive great and wholesome impetus from easy money. Overexpansion to the point of skyrocketing prices and costs would not be favorable, however. There are three possible safeguards against this development. They consist of the outflow of credit and gold to Europe, the control exercised by the federal reserve system and the self-imposed restraint of business men and bankers themselves. This latter force becomes less and less powerful as the lessons of 1920 fade further into the past.

There are strong indications that the federal reserve system is preparing to avert excessive inflation if possible. The recent reduction of the rediscount rate of the federal reserve bank of New York seemed on its face to be an invitation for loan expansion. Really, it was a first step to guard against inflation. Lower money rates here are expected to cause a flow of capital to London where interest rates are fully 1 per cent higher. Moreover, low rates will attract foreign borrowers who will help to swell the movement of credit and gold from America where it is superabundant back to Europe where it is desperately needed. The federal reserve system also holds large sums of government securities which it can market, if need be, to help regulate the money market. Present indications are that some measure of inflation is unavoidable, but that it probably will be held in check by various deterrents which will result in an extended period of business prosperity.

Restoring Foundry Apprenticeships

SO MUCH has been said on the subject of inducing boys to become apprentices in foundries that unusual interest attaches to the efforts which are being made in numerous foundry centers to encourage the boys of today to become the iron molders of tomorrow. Last week's issue of IRON TRADE REVIEW set forth in detail the well-organized plan which is being executed by the Newark Foundrymen's association. It still is too early to talk about results at Newark. The foundrymen there have much to overcome. By persuading the board of education to inaugurate a course in foundry practice at the boys vocational school there, they have made a good beginning. By advertising in the newspapers, they are telling the people of Newark about the advantage of molding as a vocation and they are endeavoring to overcome prejudices against the foundry as a place in which to work. As a result of their well-planned apprenticeship system, they know what they are going to do with the boys when they get them.

The possibilities of intelligent and persistent work along this line are clearly demonstrated by what has been done at Milwaukee. The Milwaukee foundrymen have become so much interested in apprenticeship work that at times some of the foundries there have many boys on the waiting lists. The boys of Milwaukee thus have shown that they appreciate the advantages of a foundry training as they have been pointed out to them. If the work can be done so effectively in Milwaukee, there is no reason why it cannot be done with equal success elsewhere. With a well-conceived plan and persistent effort in executing it, the foundrymen of Newark should hope for tangible results in the near future.

Farm and Mine Values Compared

REPORTS on the value of various minerals produced in the United States when grouped and summarized reveal an imposing total, though the figures fall far short of those representing the agricultural and live-stock wealth of the country. The mineral output last year was valued at $6,018,000,000, while crops were valued at $9,470,976,000 and live stock $5,181,000,000, a total of $14,651,976,000 for the products of farms.

The most striking feature of a report pertaining to mineral production just issued by the government is its showing of an increase of 29 per cent in values over the output in 1922, while for farm products the gain in 1923 was approximately only 5 per cent. The value of minerals in 1923 was but 14 per cent below the peak figure of 1920, while the value of farm products was about 40 per cent less than the value for their highest year, 1919. All the main branches of the mineral industry in 1923 showed marked improvement over the preceding years of depression, and several established new high records of production, as shown by the government report. On the other hand, while the value of crops in 1923 advanced to $9,470,976,000 from $8,961,000,000 in 1922, live stock production decreased in value from $5,349,200,000 in 1922 to $5,181,000,000 in 1923.

Britain Investigating Trade

THE special committee appointed by the McKenna government to investigate conditions and prospects of British industry and commerce, with particular reference to foreign trade, has held its preliminary meetings, and the British steelmakers are complaining that the committee is packed with free traders, with every indication that the result of the inquiry will be of doubtful value. A memorandum has been furnished the committee by the government summarizing the subjects to which its work will be devoted.

The first question to which attention is called is the position of British overseas trade and the

prospect of British participation in the markets of the world being such as to ensure sufficient and continuous employment and a satisfactory standard of living. Another question is the ability of the British industry to meet competition under the conditions thus determined, and to adopt itself to changes in the nature of overseas demand. The third question is that of the relations between those engaged in production, involving inquiry into methods of industrial remuneration, causes of unrest and disputes, "wages boards, state regulation of wages and compulsory enforcement and extension of agreements."

The only representative that the British iron and steel industry has on this committee is Sir Arthur Balfour, director of Arthur Balfour & Co., Ltd., manufacturer of high-speed and crucible steel. He is chairman of the committee.

A sidelight on the British situation is the cabled information that since the so-called McKenna duties on automobiles, watches, clocks, musical instruments and cinematograph films were abolished Aug. 1 the motorparts output in Sheffield has been reduced one-third.

When the announcement was made at the beginning of the year that the duties would be abolished the demand for automobiles dropped as buyers expected they could buy foreign cars at lower prices at a later date. Many British firms had to reduce their output by 25 per cent. One well-known firm reduced its activities approximately 50 per cent.

This state of affairs is causing anxiety among British manufacturers, and it is hoped that the United States will be asked to reduce the duty on British cars coming to America. The beneficial results of this step to Great Britain would be very small, since according to the Association of British Motor Manufacturers only 17 British private cars valued at £20,091, or about $92,000, and two commercial trucks valued at £400, or $1760, were exported to the United States in 1923.

Fortunately for the British manufacturers, the abolition of McKenna duties Aug. 1 did not include the duties on machine tools, precision instruments, gages and etc. With certain rare metals and chemicals, they still are dutiable at 33 1/3 per cent ad valorem.

Yesterdays in Industry

Trade and Technical News Reproduced from IRON TRADE REVIEW 10, 20 and 30 Years Ago

Aug. 16, 1894

DRIFT of demand from iron to steel in rolled products becoming more evident causes this comment in a description of the new plant of the Ohio Steel Co., Youngstown, O., "Since the center of iron production moved out of Pittsburgh into the valleys and steel became dominant," the iron manufacturer has been hedged in between cheaper steel and slowness to believe the preference for steel is permanent.

* * *

American pig iron under a $4 per ton duty undersells Scotch iron in Canada, but English rails and Belgian structurals are still cheaper than American material.

* * *

Statistics show that for five years pig iron production in the South has been 19 to 22 per cent of the total made in the United States.

* * *

Shortage of water, due to drought, in the Connellsville region causes further shortage of coke and idle blast furnaces are unable to obtain supplies to resume, though demand for iron is better.

Aug. 18, 1904

EDITORIAL discussion of the automobile situation gravely compares the single-cylinder motor and the engine with two or more cylinders, the former then being almost a standard. The prediction was made that the heaviest transportation of goods on streets was destined to be by truck when manufacturers of automotive vehicles had turned their attention to development.

* * *

Agitation continues over the conversion agreement of the Republic Iron & Steel Co. and the Pittsburgh Steel Co. Not only does it seem likely the billet association will be disrupted but trouble is spreading to other products and prices.

Aug. 20, 1914

PRODUCTION of bars for concrete reinforcement increased 16.5 per cent in 1913 over 1912. Iron bars for this use decreased from 2500 tons in 1912 to 113 tons in 1913.

* * *

Unfilled tonnage of the United States Steel Corp. began to increase after decline for several months.

* * *

Opening of the Panama canal to commercial use makes foreign competition on the Pacific coast less dangerous and the war cutting off imports also brings added demand to eastern mills.

* * *

Pig iron production in first half of 1914 was 12,536,094 tons, against 14,477,550 tons in last half of 1913 and 16,488,602 for first half of 1913.

Some Prices from the Past

	Aug. 16, 1894	Aug. 18, 1904	Aug. 20, 1914
Basic, Pittsburgh	....	12.60	13.90
Bessemer, Pittsburgh	11.75	12.85	14.90
No. 2 foundry, Pittsburgh	10.50	12.65	13.90
No. 2 foundry, Chicago	10.00	13.50	14.00
Lake Superior, Chicago	14.50	14.75	16.00
No. 2 southern, Birmingham	....	9.50	10.00
Bars, steel, Pittsburgh	....	1.25c	1.20c
Bars, steel, Chicago	1.30c	1.40c	1.38c
Heavy melting steel, Pittsburgh	....	11.50	11.50
Heavy melting steel, Chicago	6.00	9.50	9.50

Dawes Plan To Broaden Markets

Department of Commerce Surveys Predict Enhanced Purchasing Power for European Countries—Iron and Steel Demand Will Be Stimulated in All Consuming Nations—German Competition Not Looked To Be Detrimental To American Exporter

WASHINGTON, Aug. 19.—Just what effect the signing of the protocols of the Dawes reparations plan and the cooperation of Germany in its operation would have on general European stabilization and the subsequent stimulation of the international trade in iron and steel and other commodities has been the subject of some speculation here within the last few days. A number of the division chiefs of the department of commerce having to do with American export problems in Europe have issued statements with a unanimity of view that through operation of the Dawes plan increased purchasing power should be developed for the European nations and the American exporter placed on a more equitable basis as far as foreign competition is concerned.

Luther Becker, chief of the iron, steel and hardware division of the department, believes that demand for iron and steel goods may be expected to broaden in every market of the world, should the Dawes plan operate for more stabilized conditions. He makes no attempt to forecast what countries will more generally benefit by the probable increased world demand for iron and steel, adding that adjustments may be influenced by political rather than economic issues, or, more likely, by both with either in a subordinate position.

"The adoption of the Dawes plan will have an invigorating effect upon the international iron and steel industry," says Mr. Becker in a statement analyzing the probable results, which is published in the current issue of *Commerce Reports*, a publication of the department of commerce. "The good results may not be immediately visible in the shape of increased world production of iron and steel but enhanced German and European purchasing power is bound to result in increasing demand for products of these commodities.

"Germany produced in round numbers, 16,800,000 metric tons of pig iron and 17,500,000 tons of steel ingots in 1913. Of these amounts, Germany, exclusive of the Saar and Eastern Upper Silesia, contributed about 10,900,000 tons of pig iron and 11,600,000 tons of ingots. From these unofficial production statistics which are available, in post war years Germany has not equaled these figures, the output of pig iron being approximately 60 per cent in 1920 and approaching 80 per cent in 1922, based on the 1913 figures given above.

"Of the ore imported for the 1913 total production, 5,000,000 tons came from France, Luxemburg and Alsace-Lorraine; 4,800,000 tons from Scandinavia; 3,600,000 tons from Spain; and about 1,700,000 tons from other countries. In 1922 the sources were different, Scandinavia contributing 5,500,000 tons; France, with Alsace-Lorraine, 2,000,000 tons; Spain, 1,300,000 tons; Luxemburg, 750,000 tons; and other countries 1,450,000 tons.

"A tonnage of pig iron and steel ingots equal to the amounts produced in present Germany was consumed in 1920 in rolling mills, steelworks and foundries. This also was true in 1913. In other words, German industries produced finished rolled products, forgings, castings, machinery, rolling stock, hardware, tools and other commodities in quantities equal to its output of crude and semifinished iron and steel.

"It is generally assumed that its steelworks and finishing plants can consume more crude and semifinished material than it has furnace capacity to produce.

"It might be well to consider the present producing capacity of the countries whose output of pig iron places them in a major group. The five principal pig iron producing countries, with the capacity of each, are: United States, 45,000,000 tons; Germany, 10,900,000 tons; Great Britain, 10,500,000 tons; France, with Lorraine, 9,000,000 tons; Belgium and Luxemburg, 5,000,000 tons. These figures are based on actual accomplishments and not on estimated furnace capacity; for example, the blast furnace capacity in the United States has been estimated at from 55,000,000 tons to 65,000,000 tons, but in 1923 a record tonnage of a little more than 40,000,000 tons was reached.

"Of these five groups, the first three have finishing mills and plants which are equipped to consume all, if not more, than the given quantities of iron. The last two have been exporting pig iron and semi-finished steel.

"It seems clear, then, that if Germany does not make any further addition to its furnace plants, the situation today is unchanged, generally speaking, from that of 1913, except that for its finishing works it may draw from the Lorraine and Luxemburg districts, which in 1913 were a part of its whole unit."

Mr. Becker points out that an analysis of 5,000,000 tons of Germany's iron and steel exports in 1913 shows that 3,750,000 tons went to European countries, including Great Britain; 650,000 tons to British India, Australia and the Far East; and 400,000 tons to South American countries.

He adds that with a stabilized situation in Europe and international credits and confidence restored, world purchasing power will be enhanced. European countries will demand larger quantities of raw materials from all parts of the world, supplying those sections with the funds for the purchase of finished materials and a further development of their natural resources.

Alan G. Goldsmith, chief of the European division, who is personally familiar with prewar and present conditions in Germany believes that in view of the fact that German competition is on a stable financial basis with relation to other countries and that industry is bonded as heavily as in prewar days and that taxation in Germany will be commensurate with that prevailing in competitive countries its trade should be put on an equitable footing.

It seems plausible, Mr. Goldsmith says, that the American exporter will be able to meet foreign competition, particularly German, without fear of artificial advantages granted his business rival.

Company Takes Over Bar Mill at Joliet

The Illinois Rolling Mill Co., with headquarters at 1049 First National Bank building, Chicago, is now operating the combination Belgian type bar mill at Joliet, Ill., which formerly was a part of the Frederick Cowin plant. It is equipped to roll rounds, flats, squares, bands, hoops, angles, channels and similar products from new billet stock.

The Illinois company has taken over only the 8 and 12-inch mill and two 4-door fan-bottom coal-fired heating furnaces, and is producing only billet bars. On doubleturn, the company now has a force of 178 men. Its officials are: President, C. H. Nichols; vice president and treasurer, F. C. Richey; vice president and secretary, D. D. Richey; and vice president and manager, E. F. Sharpe. Messrs. Nichols and Richey have been in the coal business for many years. Mr. Sharpe formerly was with the Joliet Forge Co.

Shorter Workday

Producing Beneficial Results, Survey of Year's Experience Shows

Satisfactory results with a shorter workday in the steel industry are summarized in a report just issued by the Cabot fund, that financed the researches by Prof. H. B. Drury of working conditions in the steel industry in 1920. The steel industry began the abolition of the 12-hour day a year ago, keeping the pledge it gave to the late President Harding. Comments by steel executives recently as to the progress and results of the movement have been favorable. The Cabot fund survey was made by S. Adele Shaw.

The seven-day week in mills where continuous operation is the rule, which was partly eliminated during the depression of 1921, was re-established in 1922, and perhaps extended when the eight-hour day replaced the 12-hour day in many of these works, the report asserts. Moreover, there are many companies that in May, 1924, had failed to do away with the 12-hour shift; independents had not made the change in eastern Pennsylvania and the Birmingham district independents had not completely installed the 8-hour day, says the report.

Emphasizing the fact that the industry "has by no means gone to an 8-hour day and a six-day week," the survey quotes compilations of the federal department of labor for the pay period January 16 to 31, to the effect that on blast furnaces less than 8 per cent of the men work 48 hours or less a week, 6 per cent work 84 hours a week, and 32 per cent 60 hours. In the open-hearth departments, according to the same authority, only 4 per cent work 48 hours a week or less, while in the bessemer converters more than half the men work 48 hours a week.

As to increases in labor required, steel executives were unwilling to give specific figures on the ground that the data covered too short a period to be conclusive, but the report submitted various facts indicating that the increase in production cost as a result of the reduction in working hours would be relatively small.

In the rolling mills, where 10-hour shifts superseded 12-hour shifts, with payment on a tonnage basis, there has been no increase in the number of employes, the same output being obtained from 20 hours' labor on the shorter shift as was obtained from 24 hours' labor when the men worked 12 hours, the report states. For the same reason, the one-shift plants that reduced the working day from 12 to 10 hours found production little decreased. An official of an iron and steel association in the Pittsburgh district is quoted as estimating the added working force required in the blast furnaces and the open hearth department as only 12½ per cent.

"More than one company is operating its blast furnaces three shifts with no increase in the number of men over the two-shift operation," says the report. Cost of the reduced hours is expected by many steel authorities to prove considerably less than the $35,000,000 a year which the United States Steel Corp. estimated, the report asserts, because of the indirect beneficial results.

Some of these consequences are listed under the head of social effects of the granting of additional leisure to thousands of workers. The steel towns are "more normal" in appearance, exhibiting less tension and a better spirit among employes.

Railroads Unequipped To Do All Work

Washington, Aug. 19.—Findings of the interstate commerce commission with respect to construction and repair of railroad equipment review the expenditures of certain railroads for sending locomotives to outside shops for repairs shortly after expiration of government control. In the case of the Chicago, Burlington & Quincy, the Chicago, Milwaukee & St. Paul, the Philadelphia & Reading, the St. Louis-San Francisco, the Missouri Pacific, the St. Louis Southwestern and the Texas & Pacific railroads, the commission finds that it is probable that the work could have been done at a much less cost had the carriers undertaken the repairs themselves. It is pointed out, however, that some of the carriers were not equipped to properly do the work owing to heavy traffic and the poor condition of the motive power.

The purpose of the present investigation is to determine whether railroad managers have exercised diligence in expenditures and if their action was in accord with efficient management.

The commission suggests that enlargements or additions to their shop facilities would be helpful. Commissioner Hall filed a vigorous dissenting opinion.

As a tribute to the late James D. Ireland, a member of the firm of the M. A. Hanna Co., who died in Cleveland, Dec. 6, 1921, a large painted portrait has been placed in the Legion room of the Crystal Inn at Crystal Falls, Mich., at the request of the Legion and his friends in Crystal Falls. Mr. Ireland was at one time manager of mines for the Hanna company, and is remembered for his fine personality.

Soil Pipe Merger

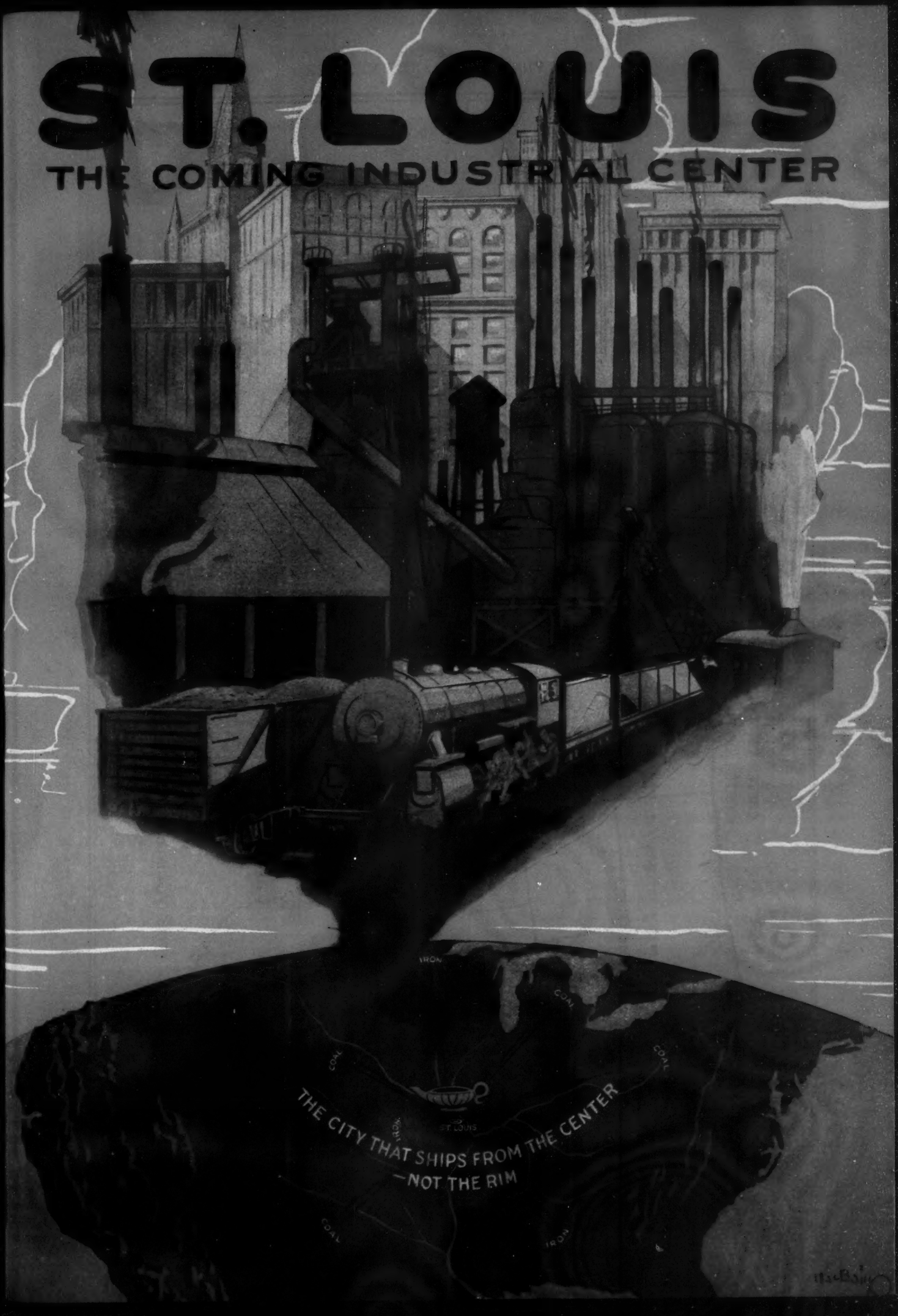
Includes Fifteen Plants in Alabama and Tennessee

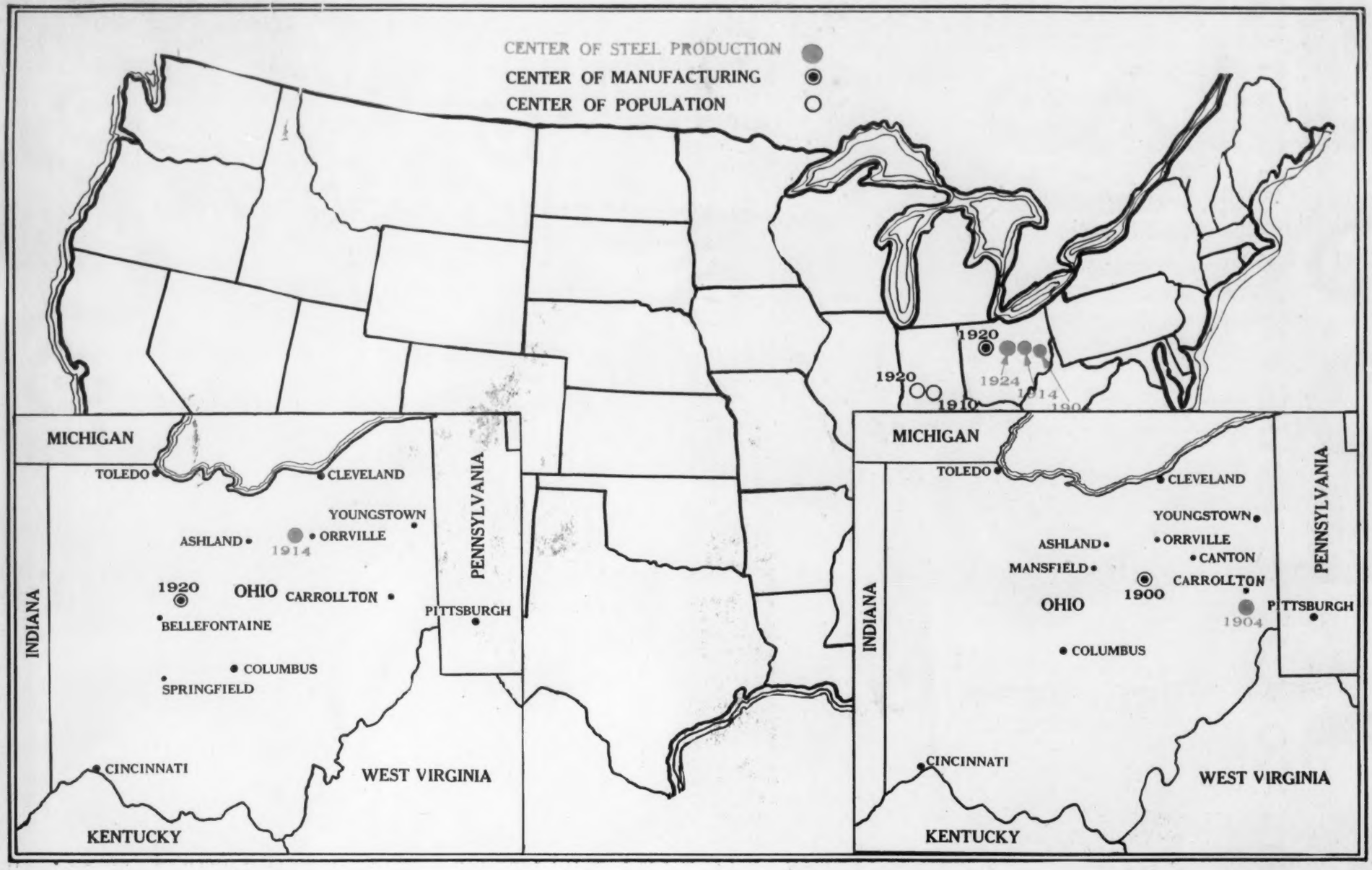
Birmingham, Ala., Aug. 18.—Fourteen plants making soil pipe and fittings and one water pipe plant, all in Aabama and Tennessee, are included in a new merger and organization. The Alabama Pipe Co. has been organized at Anniston, Ala., with Thomas E. Kilby, former governor of the state, as chairman of the board; W. F. Johnston, president; C. A. Hamilton, vice president and general manager, all of Anniston; William Byrd, Chicago, director; Whitfield Clark and T. H. Collins, directors. This company will own or control properties valued at somewhere in the neighborhood of $5,000,000. No outside financial aid was sought.

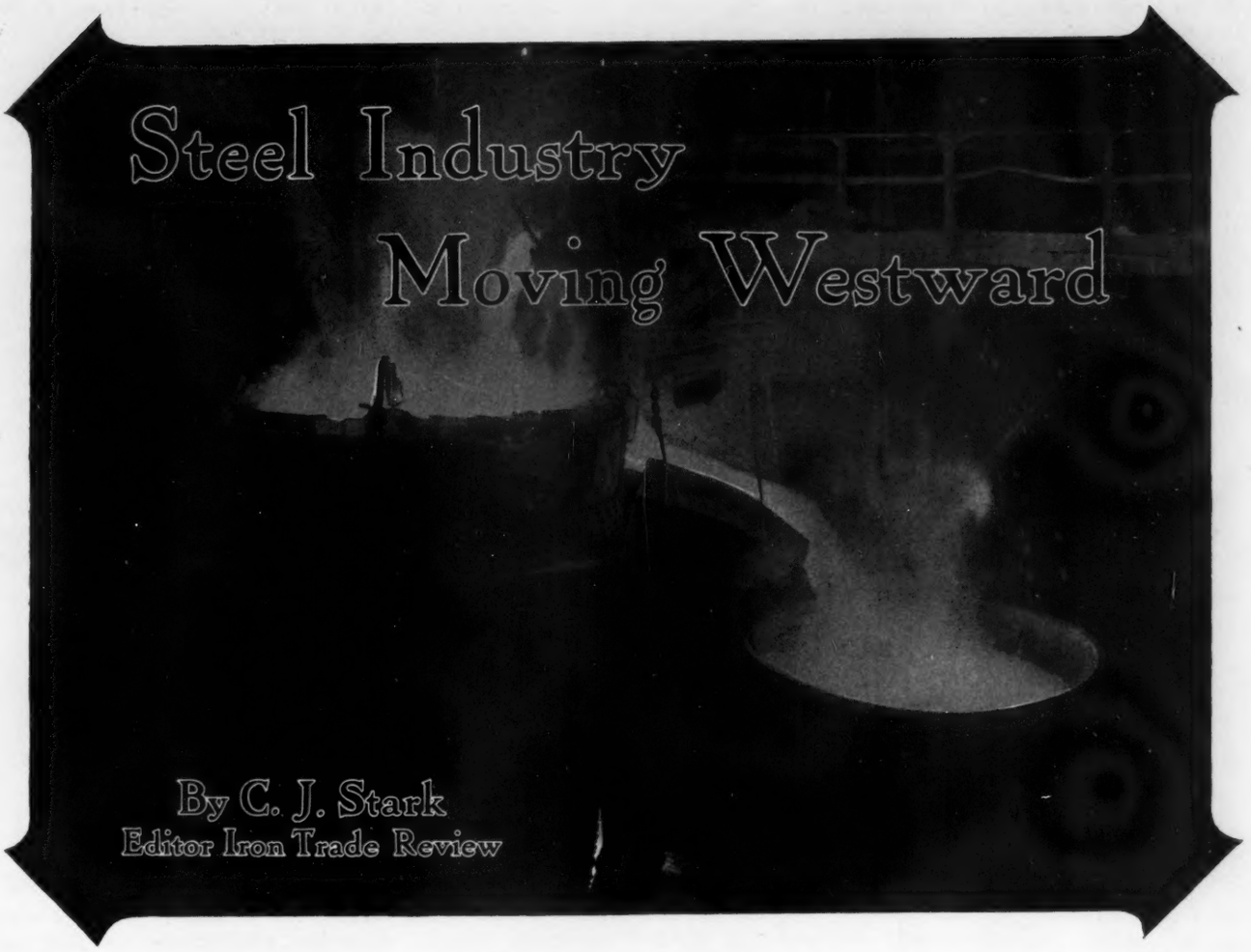
Companies which are to be included in the holdings are: Coosa Pipe & Foundry Co., Gadsden Pipe Co. and Agricola Pipe Co., Gadsden; Talladega Pipe Co., Talladega, two plants; Imperial Pipe Co., and Superior Pipe Co., Bessemer; Ornamental Foundry Co., Standard Foundry Co., (one soil pipe and one water pipe plant), Alabama Pipe & Foundry Co., and Union Foundry Co., Anniston; Rabe Pipe & Foundry Co., Chattanooga.

Recently the Gulf States Pipe Corp. with offices at Anniston, a selling agency handling soil pipe and fittings, announced its formation with Whitfield Clark as president. Several pipe shops are controlled by it. A statement to the trade has been issued in which the output of the following plants is covered: Amory Foundry Co., Anniston; Independent Soil Pipe Co., Anniston; the Southern Pipe & Foundry Co., Knoxville, Tenn.; Kilby Pipe Co., Birmingham; Rudisill Soil Pipe Co., Anniston; Southern Pipe Foundry Co., Birmingham; Interstate Foundry Co., Anniston.

The officers and stockholders of the Gulf States Pipe Corp., are practically the same as in the Alabama Pipe Co., just formed. Among the other plants which are not included as far as yet known in the new merger or consolidation are the following: Central Foundry Co., three plants in Alabama; Birmingham Machine & Foundry Co., two shops; Cox Foundry Co., Bessemer; Davis Pipe & Foundry Co., Birmingham; Sanitary Fittings Co., Birmingham; Bessemer Soil Pipe Co., Bessemer Soil Pipe Co., Bessemer; Anniston Foundry Co., Anniston; Anniston Soil Pipe Co.; Casey-Hedges Co. and Somerville Iron Works Co., Chattanooga, Tenn.; National Pipe & Foundry Co., Attalla, Ala.; Charlotte Pipe & Foundry Co., Charlotte, N. C.; Iron City Pipe & Foundry Co., Birmingham.


ST. LOUIS
THE COMING INDUSTRIAL CENTER
IRON
COAL
COAL
COAL
IRON
ST. LOUIS
THE CITY THAT SHIPS FROM THE CENTER
—NOT THE RIM
COAL
IRON


CENTER OF STEEL PRODUCTION
CENTER OF MANUFACTURING
CENTER OF POPULATION
1920
1924
1914
1910
1900
MICHIGAN
TOLEDO
CLEVELAND
YOUNGSTOWN
ASHLAND
ORRVILLE
1914
1920
OHIO
CARROLLTON
BELLEFONTAINE
COLUMBUS
SPRINGFIELD
CINCINNATI
KENTUCKY
WEST VIRGINIA
PENNSYLVANIA
PITTSBURGH
INDIANA
MANSFIELD
CANTON
1904



Steel Industry Moving Westward

By C. J. Stark
Editor Iron Trade Review

KEEPING step with the moving trend of population and of general manufacturing, the steel industry of the United States gradually is regrouping itself westward. This process of re-location, while it has been retarded to some extent in the past ten years by some extraordinary factors, of an uneconomic character, has gone forward, none the less, surely and steadily. The comparative record of the years gives to this movement a true perspective in the broad, fundamental readjustment to which American industry, particularly in recent years, has been subject.

During the past 20 years, the center of gravity in the steel industry has been progressing to the West at the rate of about three miles per year. In all this period the state of Ohio has been and remains the region in which this center falls. Apparently closely related to this determination is the fact that the center of manufactures of the country also has been in the state of Ohio for the past 30 years or more. In 1904 the center of the gravity of the steel industry was in the northeast section of Ohio 28 miles west of the Ohio-Pennsylvania state line or near the city of Carrollton, Carroll county. In 1914 it had moved 35 miles westward in a slightly northerly direction, taking its position near Orrville, O., in Wayne county. This was a point 62 miles west of the Ohio-Pennsylvania line. Ten years later or at the present time, the center is to be found at Ashland, O., in Ashland county, 29 miles west of the 1914 point on a practically horizontal line or 92 miles from the Ohio-Pennsylvania line. During the 20 years, the gravity point had advanced a total of 64 miles.

These centers of gravity of the steel industry have been determined in accordance with the general principles adopted by the bureau of the census of the United States government in arriving at the centers of population, of manufacturers, of agriculture, etc. These centers represent the pivotal point at which the entire steel industry of the country would hang in balance. They are determined by the convergence of various horizontal and vertical lines representing the centers of steel ingot capacity of the respective states which are computed to possess varying weight or value in accordance with their tonnage capacity and the distance geographically from a given point.

In 1904 the total capacity of the steel industry of the United States was approximately 22,000,000 gross tons of ingots. At that time 61.49 per cent of the steel ingot capacity of the country was east of the Ohio-Pennsylvania state line and 38.51 per cent west of that point. The state of Pennsylvania then embraced more than one-half of the total steel ingot capacity of the nation or 50.54 per cent. When 10 years later, the center of the industry had progressed a number of miles westward, this change was accomplished by the increased growth relatively as steel producers of such states as Ohio, Illinois and West Virginia compared with the 10 years previously.

During the 10-year period of 1904 to 1914 there was added to the total steel ingot capacity of the country, bessemer converters and open-hearth furnaces capable of producing 15,676,000 gross tons annually or an increase of 71.4 per cent. Of this new total Pennsylvania contributed 6,271,000 tons; New York, 801,500 tons; Maryland, 93,000 tons; Rhode Island, 26,500 tons; and Connecticut, 18,000 tons. On the other hand, New Jersey lost 50,000 tons; Delaware, 25,000 tons and Massachusetts, 4000 tons. This made a net total gain in the decade for the eastern states of 7,131,000 tons. In the same period, Ohio had constructed new capacity of 3,637,000 tons; Indiana of 2,841,000 tons; Illinois of 595,000 tons; West Virginia of 436,000 tons; Colorado of 400,000 tons; Alabama of

265,000 tons; Kentucky of 184,000 tons; Georgia of 85,000 tons; Washington of 60,000 tons and California of 42,000 tons. This made a total of 8,545,000 tons of added capacity for the steel producing territory west, or south and west of the Ohio-Pennsylvania line.

In the expansion of the 1904-1914 period, consequently, the eastern states failed to hold their own in the growth of the industry. They supplied 45.49 per cent of the new capacity as against 54.51 per cent by the western area. Of the total capacity of the country at the end of 1914, however, 54.81 per cent still remained east of the Ohio-Pennsylvania line and 45.19 per cent, west.

The loss in proportional standing to the eastern region as compared with 10 years previously was 6.68 per cent with a corresponding gain for the western states. Pennsylvania had dropped from this condition than the states to the west. This is because a considerable part of the new construction stimulated by war demands, was laid down as enlargements of existing plants because that was the simplest and most logical way to have it provided and put on a productive basis in the shortest period of time. The factor of strategic geographical location relative to future markets and trade extension was not taken so much into account in some of these cases as probably would have been had it not been a time of war. The main problem for a number of companies, under pressure of the government and the allies, was to produce an increased tonnage of steel to meet the tremendous requirements of the war and the speed by which this could be done was the prime essential. The normal course of the development of the industry was

350,000 tons; California from 42,000 tons to 307,000 tons or by 265,000 tons; Georgia from 85,000 tons to 120,000 tons or by 35,000 tons; and Washington from 60,000 tons to 112,000 tons or by 52,000 tons. This period saw some new names in the list of producers of steel ingots including Minnesota with 350,000 tons; Missouri with 275,000 tons and Utah with 70,000 tons.

The combined gains of the western states in the 10 years were 10,559,500 tons. This constituted 60.53 per cent of the total gain of the country in this decade.

On the side of the eastern states, Pennsylvania increased its capacity by 4,270,000 tons; New York by 920,500 tons; Maryland by 902,000 tons; Delaware by 670,000 tons; New Jersey by 125,000 tons; while Massachusetts, Connecticut and Rhode Island showed unchanged

Twenty Years Trend of New Steel Ingot Capacity

	1904-1914		1914-1924	
	Gain Tonnage	Gain Per Cent	Gain Tonnage	Gain Per Cent
Pennsylvania and eastern states	7,131,000	45.49	6,887,000	39.47
Ohio and western states	8,545,000	54.51	10,559,500	60.53
All United States	15,676,000	71.4	17,446,500	31.67

from the point of holding 50.54 per cent of the country's capacity to 46.15 per cent, while Ohio had gained from 18 per cent to 20.17 per cent. The construction of the great Gary, Ind., plant of the United States Steel Corp. in this period had been responsible for the largest gain by Indiana of any state, amounting to 2,841,000 tons. This gave Indiana 7.88 per cent of the country's entire capacity. Curiously, Illinois had not kept up with the growth of the other western states. While it showed a gain in gross, its percentage of the total of the country had fallen from 11.33 in 1904 to 8.20 in 1914. This was occasioned principally by the decline of the bessemer process which had set in decisively in this decade. While Illinois showed a gain of 900,000 tons of open-hearth capacity, it also had lost 305,000 tons by the abandonment of some of its bessemer converters.

Despite the war, the greater western concentration of the steel industry went forward from 1914 to 1924 at about the same pace as in the preceding 10 years. Considerations not especially of an economic character and related more to national need than to the accommodation of new or potential markets, clearly dictated the building and location of much of the new construction from the beginning of 1915 and well into 1919. The eastern region probably profited more

modified to that extent. In the war period of 1914-1918 and in the succeeding year, 13,483,500 tons of new capacity was initiated and completed. Of this total the portion of the eastern states was 5,609,000 tons or 41.91 per cent and of the western, 7,774,500 tons or 58.09 per cent.

The increase in the total steel capacity of the country from 1914 to 1924 was from 37,639,500 to 55,086,000 gross tons, amounting to 17,446,500 tons or 31.67 per cent. At the end of that period, for the first time, the combined capacities of Ohio and the western group exceeded that of Pennsylvania and the eastern states. In 1924 the former represented in the aggregate, 51.06 per cent of the entire country. In these 10 years Ohio showed the greatest gain of any individual state, from 7,592,000 tons to 13,004,500 tons or 5,412,500 tons. This was a gain of 41.62 per cent for this state. This brought Ohio up to the point where at the present time it represents about one-fourth of the country's ingot production. Illinois established an increase from 3,085,000 tons to 4,135,000 tons or by 1,050,000 tons; Indiana from 2,699,000 tons to 4,946,000 tons or by 1,980,000 tons; West Virginia from 776,000 tons to 1,376,000 tons or by 600,000 tons; Alabama from 77,000 tons to 890,000 tons or by 120,000 tons; Kentucky from 430,000 tons to 780,000 tons or by

totals. The combined gain of these states was 6,887,000 tons or 39.57 per cent of the country's entire expansion.

Pennsylvania's gain in this period was 24.48 per cent of the total increase of the United States. This compared with 40.0 per cent in the 10 years preceding. At present Pennsylvania remains the largest single producer but its proportion of the total has fallen back and now stands at 39.29 per cent; 10 years ago it was 46.15 per cent and 20 years ago, 50.54 per cent.

In the past 20 years Ohio has risen from 18.00 per cent to 23.60 per cent; Indiana from 0.57 per cent to 8.98 per cent; West Virginia, from 1.55 per cent to 3.50 per cent; Delaware, from 0.67 per cent to 1.44 per cent; Kentucky, from 1.12 per cent to 1.42 per cent; Rhode Island, from 0.04 to 0.07 per cent. California gained from 0.17 per cent in 1914 to 0.56 per cent in 1924. Missouri, Minnesota and Utah, newcomers in the past 10 years, now have 0.50 per cent, 0.64 per cent and 0.13 per cent, respectively.

Besides Pennsylvania, those states which have not kept up their relative standing since 1904 are Illinois which has gone from 11.33 per cent to 8.20 per cent in the past 20 years; New York, from 6.10 per cent to 5.56 per cent; Colorado, from 3.64 per cent to

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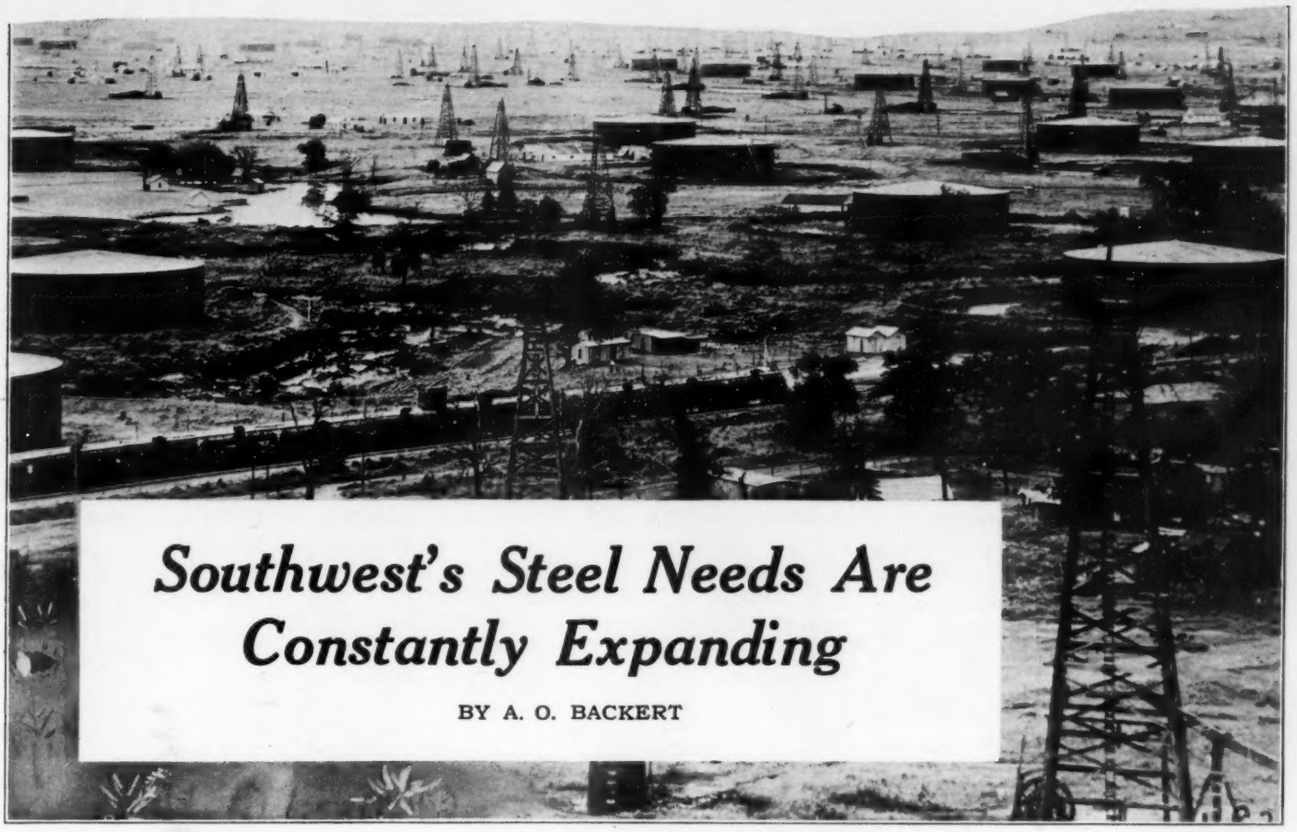


Southwest's Steel Needs Are Constantly Expanding

BY A. O. BACKERT

The author is president of the Penton Publishing Co., publisher of IRON TRADE REVIEW.

FEW territories in the United States call for so large an annual requirement of steel for manufacturing, for construction and for the development and marketing of national resources with so small a fraction of the demand being produced within themselves as the region of St. Louis and the Southwest. In this respect St. Louis and its tributary area are comparable to New England, the Detroit district and the Pacific Coast. Probably in none of these districts, however, is steel consumption so diversified or is showing so constant a growth year by year, with the possible exception of the Pacific Coast.

Based on the most definite data available and upon the highest personal authority, it is estimated that St. Louis and the Southwest normally absorb 10 to 15 per cent of the total tonnage of finished steel turned out by the mills of the United States. This conservatively would mean not less than 3,000,000 to 4,000,000 gross tons. This tonnage includes virtually every form of finished material but the outstanding demand is represented by tubular goods, plates, structural shapes, steel bars, wire products, blue annealed sheets and rails. Of these products tubular goods rank among the greatest for the region because of the extensive oil and gas development of the Mid-Continent and southwestern fields.

At the present time the St. Louis district embraces mill capacity for the production of such rolled forms as plates, standard structural shapes up to and including 10-inch sizes, merchant bars and small shapes, reinforcing bars, tin plate, black, blue annealed and galvanized sheets; strips, tie plates, etc. No rails or tubes are rolled in the region, although one plant with a large capacity for renewed rails is located in Kansas. Some wire mill capacity is operated in the general district but outside the immediate St. Louis area.

St. Louis Steel Capacity

The St. Louis district is credited with the finished steel capacity of probably 750,000 tons annually. Its potential steel ingot production is about 600,000 tons a year.

The excess of finished steel and steel ingots is due to the several mills which roll scrap steel rails in their various finished forms. The unusual position of St. Louis as the focusing point for a great scrap producing territory affords the mills special advantages for the rolling of rail steel products. The finished steel capacity of the St. Louis district roughly is made up of about 50,000 tons of sheets, 80,000 tons of black plate, 90,000 tons of hot-rolled strip, 275,000 tons of bars and small shapes, 100,000 tons of standard structural shapes, 80,000 tons of wire and wire mill products, and the remainder of a scattering character.

The territory which the mills of St. Louis and vicinity consider as their logical distributing area extends east to Indianapolis, north to central part of Illinois, the southern part of Iowa and Kansas, all of Oklahoma, Arkansas and the northern portion of Texas.

One of the chief sources of steel demand in the Southwest is through the oil and gas fields of Oklahoma, Louisiana, Arkansas and Texas. These fields today are producing probably 50 per cent of the petroleum output of the country and the new development work of this character is the greatest of any similar region. It is stated conservatively that 20 to 25 per cent of the total production of tubular goods of the country is absorbed by this region. This totals substantially 500,000 to 600,000 tons annually. All of this tonnage is drawn from mills in the Pittsburgh, Wheeling and Chicago districts since there are no pipe plants nearer to the southwestern fields than Chicago, about 730 miles away.

Important quantities of steel pipe pass through St. Louis every year enroute to the southwestern fields. A considerable portion of this is being handled down the Ohio and Msisissippi river by barge from the mills at Pittsburgh and Wheeling.

In addition to the pipe requirements, the oil and gas territory of the Southwest affords a large outlet for other forms of steel including plates, shapes and bars for storage tanks, derricks, refineries, operating buildings, etc., wire for cables and other material for drilling

and pumping outfits, etc. Most of the new pipe line projects which have been put forth in recent months are in connection with the southwestern fields. It is estimated that in storage tanks alone probably 300,000 to 350,000 tons of plates are required annually by this region but most of the fabrication of this is done by shops in the Chicago, Pittsburgh and Ohio districts. Probably a grand total of 1,000,000 tons annually of mill products would not be an excessive estimate of the normal requirements of the southwestern oil and gas fields.

Sheet Requirements Large

Sheet requirements represent one of the largest outlets of steel in the St. Louis zone. Some of the products into which this material heavily enters are enameled and stamped ware, furnaces, stoves, ranges and heaters, automobile bodies and parts, electrical machinery and metal products of various descriptions.

St. Louis occupies a high position in American manufacturing for its large output of enameled ware. Thousands of tons of sheet or tin mill products are consumed annually in this form. The stove and range industry in which St. Louis has pre-eminence by a wide margin as to extent and output, over any other city in the country, absorbs a large tonnage of blue annealed and black sheets. Some of these plants individually account for 10,000 tons of sheets annually. The manufacture of electrical equipment has enjoyed a strong development and the largest plant of this kind west of the Mississippi river is in St. Louis. A fair estimate places the needs of the St. Louis district in all grades of sheets and tin mill products as probably 200,000 to 300,000 tons annually.

Railroad requirements of the St. Louis district are large. Just what this total tonnage would represent actually is difficult to arrive at because many of the 20-odd lines that enter the city are part of leading systems, the general steel purchases of which are made at some other center and distributed along the property. However, buying of several important roads is done through St. Louis. Railroad requirements for track purposes which are considered to belong to the St. Louis market proper or those which are placed in that city, are put at 150,000 to 200,000 tons, annually, this including 120,000 tons of rails and the remainder, spikes, angle bars, tie plates, track bolts and other railroad track fastenings.

Probably 200,000 tons additional of rolled material goes into the St. Louis district in a normal year for railroad use. This is made up chiefly of material for car building purposes, for bridge work and other construction and for miscellaneous requirements.

Rolled Steel Capacity St. Louis District

Form	Gross Tons
Bars and small shapes	275,000
Standard shapes	100,000
Renewed rails	100,000
Hot rolled strip	90,000
Sheets	80,000
Wire products	80,000
Tin plate	60,000
Plates	50,000
Scattering	25,000
Total	860,000

Not less than 150,000 to 200,000 tons of plates, shapes and bars would represent the normal needs of St. Louis and surrounding territory for building and other structural purposes. The city of St. Louis proper is credited with a yearly requirement of approximately 100,000 tons, this including, however, considerable tonnage for manufacturing use as well as for building construction. If to the building steel requirements of the region, is added the material in the form of plates and bars going into general manufacturing and fabrication other than buildings, the total for St. Louis and the Southwest probably would reach 400,000 tons yearly of plates, shapes and bars.

Manufacturing requirements of steel in the immediate St. Louis area embrace practically every finished steel product but include in a more important way, steel bars, structural shapes, plates, wire, sheets and tin plate. A considerable tonnage of rails is used for the manufacture of frogs, switches and special track work. Large quantities of sheets and tin plates go into containers for paints and varnishes and into other pressed products apart from kitchen utensils.

In addition to the important tonnage finished within the district, a large quantity of sheets and black plate is formed into blanks and shipped to outside points for final fabrication. The tonnage converted into screw products is important.

Patch bolts for boilers is one of the many specialties manufactured in the district. The requirements of steel for the building of sugar machinery destined for the South and Cuba and for miscellaneous machinery are considerable.

Center for Wire Articles

Heavy consumption of wire products normally is to be noted in the Southwest. St. Louis is an important center for the production of articles made from wire. Next to Trenton it is the largest point for the manufacture of wire rope in the country. The range of other articles of wire is extensive, consisting of wire mesh, industrial screens of all kinds, fencing, grill and lattice work, etc. The farming community of the Southwest is another great channel for wire distribution no estimate of the needs of which is forthcoming. This is especially true of wire fence.

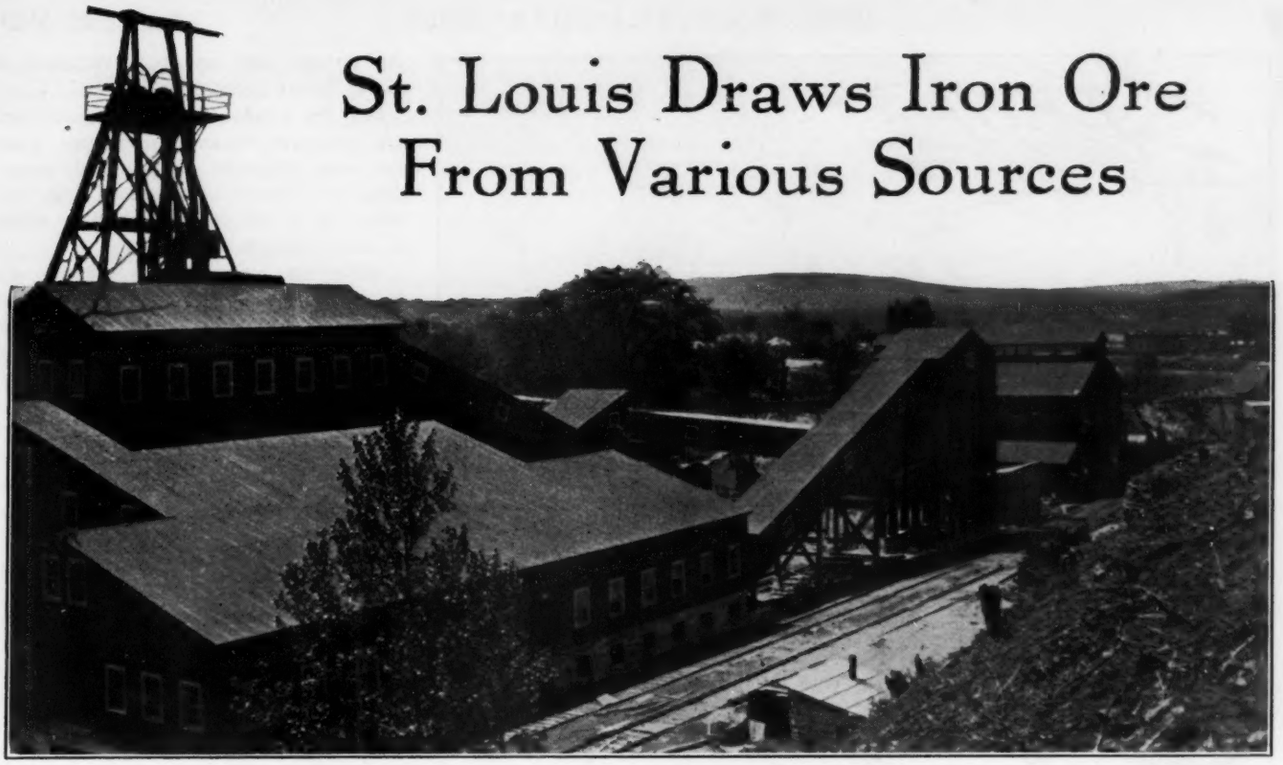
Because of the absence of a mill source of supply immediately at hand for many rolled products, the St. Louis jobber occupies a very important position in the chain of iron and steel distribution in the southwestern zone. It is estimated that approximately 200,000 tons of finished iron and steel material passes through the various warehouses of the territory. These products include principally pipe, structural shapes, plates, bars and sheets. One of the jobber group handles about 25,000 tons annually; another, about 20,000 tons while eight or 10 warehouses distribute 5000 to 10,000 tons each annually. The geographical zone served by the St. Louis group of jobbers is very extensive, running to Terre Haute and Evansville on the east, Peoria on the northeast, Rock Island, Des Moines and Omaha on the north and northwest, Kansas City on the west and all of Oklahoma, all of Arkansas and the northern part of Texas on the South.

Consume Much Pig Iron

Consumption of pig iron in what properly may be termed St. Louis territory is estimated at about 600,000 tons annually, made up of foundry, basic, malleable and charcoal grades. The territory so embraced includes southern Illinois, southern Indiana, Missouri, Kansas, Oklahoma, Iowa, Nebraska and northern Texas. Roughly, the total annual needs of the region are divided into about 275,000 tons of foundry, 200,000 tons of basic, 100,000 tons of malleable and 25,000 tons of car wheel iron. Some estimates place the tonnage at a considerable higher figure, up to 900,000 tons. In doing so, however, a much larger area of potential selling territory is included than ordinarily would be conceded to St. Louis, under competitive conditions.

The estimated annual consumption of 600,000 tons is based on a favorable market situation in pig iron with respect to scrap. Because of the abundant tonnage, the latter is a very strong competitor of pig iron in the greater St. Louis territory. This is particularly illustrated in the case of the open-hearth steel plants of the territory. The eight or 10 steelworks and foundries in this group have an annual capacity of 800,000 tons yet they are credited with a normal consumption of only about 200,000 tons of pig iron, the remainder being made up of scrap. Some foundries use almost an entire scrap mixture.

St. Louis Draws Iron Ore From Various Sources



Fifty thousand tons of iron ore concentrates have been shipped from the new mill at Iron Mountain since May 1, 1924. The steel headframe of the mine shaft may be noted at the left in the illustration

Seeks To Overcome Disadvantage of Long Freight Haul By Developing Deposits at Iron Mountain

BY A. J. HAIN

THE "rediscovery" of iron ore in Missouri has aroused considerable interest in the possibility of St. Louis blast furnace requirements being supplied entirely from that source. The state of Missouri shipped ore to other consuming centers long before the beginning of mine operations in the Lake Superior district. There never has been any question about the state having an abundance of material, but with the opening of the larger ranges, and the advent of low-cost water haulage by lake to eastern states, mining activity in Missouri receded.

St. Louis did not have a pig iron manufacturing industry that necessitated the development of Missouri mine operations. The ore deposits were not forgotten; they were not worked because they could not compete with the flood from Lake Superior mines. The "rediscovery," as it has been called in some recent references to Missouri ore, is not strictly correct; but rather there is a reawakening of opportunities, because of the development of the furnace industry in St. Louis.

Missouri iron ore now is being mined and concentrated and shipped to Granite City, under the price of Lake Superior ore, and there is a probability that requirements will be supplied to a greater extent from the native deposits. Whether Missouri has sufficient to support a large industry for an indefinite period, however, is seriously open to doubt.

The author is editorial representative at Cleveland of IRON TRADE REVIEW.

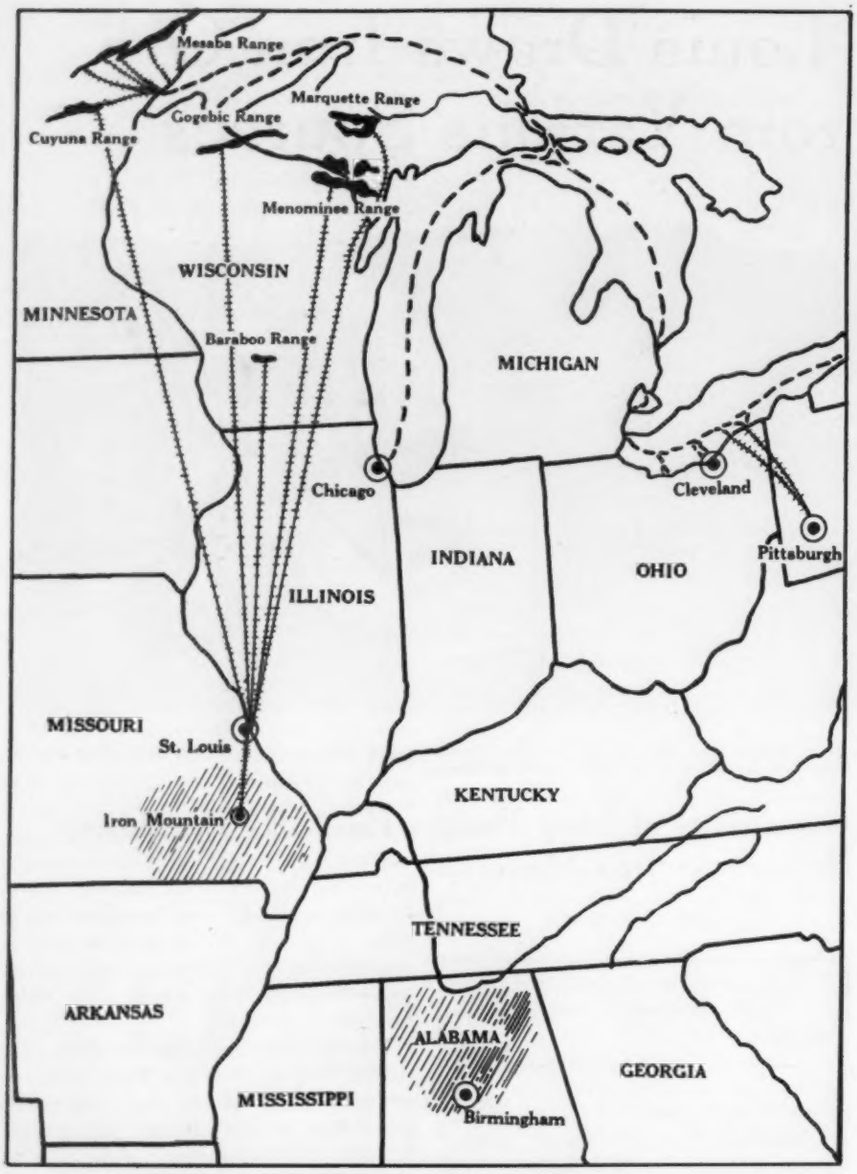
St. Louis also is within 400 miles of the extensive reserves, so-called red Clinton hematites, in northern Alabama. Those grades average around 39 to 40 per cent metallic iron. It has access to the Alabama deposits by way of the Tennessee river, and also by two railroad routes. A difficulty, however, is the fact that approximately two to two and one-half tons of the ore would have to be transported for every ton of pig iron manufactured. For lake ore the proportion is 1.85. Even less of the concentrate from Iron Mountain, Missouri, needs to be shipped in order to make a ton of pig iron.

Unfortunately for St. Louis, the present supply from Iron Mountain is not adequate. The high cost of an all-rail haul from the Lake Superior district is offset to some extent by the mixture of lake ore with that from Iron Mountain. No ore is obtained from Alabama. St. Louis is forced to rely for approximately one-half of its supply on the lake ranges, 700 miles away.

The position the city occupies with respect to its raw materials leads to an appreciation of the part transportation plays in the strategy of modern industry. Transportation is the key to the availability of material, and ore is relatively valuable according to its locality, and advantages or disadvantages of consumers with respect to freight. The disadvantages of transporting the best grade of natural ore a long distance may be so serious as to lead to beneficiation of leaner grades of ore near at hand. This has transpired before, and it is reoccurring in the construction of a concentrating mill at Iron Mountain, 90 miles from St. Louis.

Not only is the lean material being concentrated successfully, but it is believed a body of primary ore has been tapped, and will not need concentrating. Actually 50,000 tons of concentrated ore has been produced at Iron Mountain since May 1, 1924.

It is not known how much the obstacles of high freight rates from the Lake Superior district are offset by concessions in prices of the ore at the mine, due to long-term contracts and other considerations. But



ST. LOUIS' POSITION ON THE IRON ORE MAP, SHOWING THE PRINCIPAL RAILROAD ROUTES FROM SOURCES OF SUPPLY, AND COMPARING WITH WATER AND RAIL ROUTES FROM THE LAKE SUPERIOR DISTRICT TO OTHER STEEL CENTERS

for practical purposes in comparing St. Louis' position with that of other consuming districts, open market quotations and the published freight rates must be used as the bases.

A point of immediate importance is that St. Louis is practically shut out of the Mesabi range, and therefore loses the benefit of Mesabi range prices, which are 15 to 25 cents under old range prices. It is excluded by the fact that the freight rate from the old ranges to St. Louis is $2.93, while from the Mesabi range it is $4.15. Why this great difference exists is not entirely clear, but because of it no ore has moved from the Mesabi range to St. Louis. This is true despite the fact the Mesabi range is relatively a short distance further north than the Cuyuna range, which has a $2.93 rate.

Another feature of importance is that the railroads have not established dock facilities at Chicago, so that iron ore from the head of the lakes may be shipped to Chicago by water, and thence by rail to St. Louis. The only time ore moved this way was in 1921, with a small shipment, made under special circumstances, the ore being handled over a private dock. The line haul rate, Chicago to Granite City, then established was $1.40, and it still is in effect. Dockage charges would bring this up to $1.65.

A railroad company might be induced to build a dock, if the tonnage could be increased, and with the building of the dock and the consequent lessening of the freight charge, a reduction probably would be made by other competing roads handling ore all-rail from the northern ranges to the St. Louis district. A rate from Chicago to St. Louis, lower than the present one, may be established at some future time.

For the present, St. Louis purchasers are restricted to an all-rail haul from the Lake Superior district, and cannot draw on Mesabi ores. How does this affect them, in comparison with those in other districts?

When the producer sells ore for delivery down the lakes he pays the cost of the rail haul from mine to lake shipping port, and also the lake vessel rate. He quotes a price for the ore delivered at the lower lake ports. His total transportation cost, from the Cuyuna range to Lake Erie port, for example, is $1.74, and from the eastern Marquette, $1.40.

When selling to St. Louis this transportation cost, plus 5 cents covering insurance and interest charges, are deducted from the lower-lake price, to determine the value of the ore at the mine. The St. Louis buyer pays a freight of $2.93 on ore to St. Louis from the Cuyuna, Gogebic, Menominee and Marquette ranges. The rate from the Baraboo range, in Wisconsin, to St. Louis is $2.12, but this point is of least importance to the St. Louis furnaceman.

Furnaces located at Cleveland and Chicago have a great advantage over those at St. Louis, with respect to ore. Furnaces situated inland, in Ohio, Pennsylvania, and adjoining states, must pay the railroad freight rate from the lower lake ports to their plants. This reduces their advantage. How it works out may be seen from the following:

A ton of standard Mesabi nonbessemer ore delivered direct to plant, costs a buyer at Chicago $4.75; at Cleveland, $4.75; in the valley $5.65, and at Pittsburgh $5.98. As the St. Louis purchaser practically is excluded from Mesabi ore there is no purpose in attempting to give a comparable figure for St. Louis. However, the purchaser taking the same standard grade of nonbessemer ore from the Cuyuna range, costing 15 cents more at the mine, would pay $6.04 for the ore delivered at his plant.

The difference in favor of Chicago is $1.29, and the same for Cleveland; 39 cents in favor of the valley and 6 cents in favor of Pittsburgh. The advantage for Chicago on a ton of pig iron made with this grade of ore would be approximately $2.58. A similar advantage would be Cleveland's. The valley producer would be 78 cents ahead, while the advantage with Pittsburgh is 12 cents. St. Louis is approximately 700 miles from the Cuyuna range, while Pittsburgh is about 1200.

Considering standard old range nonbessemer ore delivered from the eastern Marquette range, the advantage for the Chicago, Cleveland, valley and Pittsburgh furnaces increases considerably. This is true because the ore produce

has less to deduct to arrive at his mine price, while the railroad rate to St. Louis remains $2.93. All furnaces in this instance buy on an old range price basis, and from the same range. A ton of the ore costs a buyer at Chicago $4.90; at Cleveland $4.90; in the valley $5.80 and at Pittsburgh $6.13. The same ore delivered to St. Louis costs the buyer $6.30. The ore cost, per ton of pig iron manufactured, at Cleveland and Chicago is $2.96 less than at St. Louis; in the valley $1.16 less than at St. Louis, and at Pittsburgh, 50 cents less. These additional advantages result from the fact that the shipping point is about 300 miles further down the lake, for the eastern consumers, while it is in effect the same from the standpoint of St. Louis.

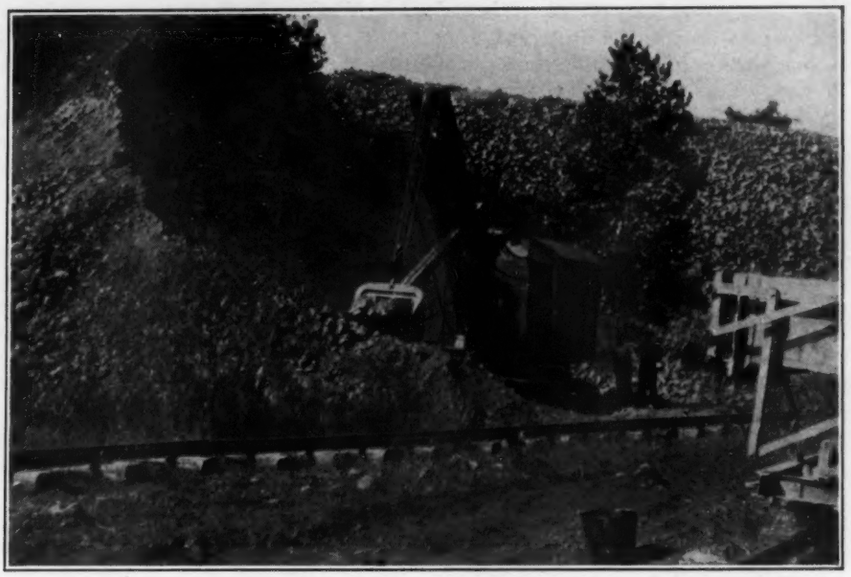
Subtracting the rail freight from Mesabi mine to lake shipping port, 91 cents, the vessel rate to lower lake port, 83 cents, and 5 cents for interest and insurance the price of Mesabi nonbessemer ore at the mine is $2.96. The rail freight from the eastern Marquette range to lake shipping point is 64 cents and the vessel rate to lower lake ports, 76 cents. These items, plus 5 cents, deducted from the market price of the Marquette range nonbessemer ore yields a mine price of $3.45.

The St. Louis purchaser pays $6.04 a ton for Cuyuna nonbessemer ore delivered to his plant, and $6.38 for the Marquette nonbessemer ore. The railroad freight rate from the principal producing district in Missouri, Iron Mountain, is 95 cents. To compete with Cuyuna ore the mine price for Missouri would have to be $5.09, and in competition with Marquette ore, $5.43.

Can the Missouri ore producer mine and concentrate material at these prices? He is doing it, and is underselling Lake Superior ore in Granite City. It is understood that as a result of the development at Iron Mountain, ore comparable with the standard bessemer grade can be delivered at Granite City as low as 6 cents per unit. The unit price of bessemer ore from the Lake Superior district delivered at lower lake port is 12.3 and 12.8 cents, and this with the ore marked down 80 cents a ton from the figure of 1923. The ore has no physical defects, and no disadvantages from the standpoint of its chemical constituents; its only limitation is in the amount available.

* * *

LARGE undeveloped deposits of iron ore are known to exist in Missouri. The state's resources in ore were not depleted, although the best and most readily available ore naturally were used first. What is true of this district holds good for all iron ore areas. Leaner material is being brought into use through gradual stages. In the Lake Superior district there have come into existence in the last few years scores of plants for washing ore, and the large magnetic separation plant on the East Mesabi is evidence of the trend toward concentration.



WHILE MINING AT IRON MOUNTAIN IS UNDERGROUND, A CONSIDERABLE TONNAGE OF THE MATERIAL FOR CONCENTRATION IS SCOOPED UP BY STEAM SHOVEL. THIS WAS LEFT FROM SURFACE WORKINGS ABANDONED YEARS AGO

The recent development at Iron Mountain, Missouri, represents another step in the same direction. Iron Mountain always had and still has the largest deposit of ore in Missouri. Its output of 3,500,000 tons before the present undertaking, represented nearly 40 per cent of all the ore ever mined in the state. Pilot Knob, containing the second largest deposit, produced approximately 2,000,000 tons before its operation lapsed. Iron Mountain was first opened in 1845, and Pilot Knob a few years later. These mines were producing important quantities of ore before the development of the Lake Superior district. The largest output from Iron Mountain in any year was 269,480 tons in 1872, and the largest from Pilot Knob, 501,892 tons in 1881. For 16 years, 1893-1908, there was no production at Pilot Knob, while in that period, the tonnage mined annually at Iron Mountain shrank from 79,000 to 8000. Iron Mountain was closed down in 1893.

Developing Iron Mountain

Events leading to the "rediscovery" at Iron Mountain were in time with the placing in operation at Granite City, Ill., a modern blast furnace plant by the St. Louis Coke & Iron Co., in 1921. A group of Chicago men, with Leonard A. Busby, as president, organized the Iron Mountain Co., and decided in 1922 to develop its resources. Two years had been spent in preliminary investigation. The engineers gave their opinion that there probably is 12,000,000 to 30,000,000 tons of ore reserves in the mineral tract including Iron Mountain, and comprising 320 acres. The Iron Mountain property contains only 16,000 acres, five miles square. Here the ore in sight and the additional prospects were considered sufficient to justify the construction of a concentrating mill. The preliminary experimental work and the mill have cost approximately $200,000.

Ore is obtained principally from underground. Some also is being taken by steam shovel from surface dumps left by former operators, although there are no new surface workings. A shaft was sunk, with steel headframe and electric hoist, the capacity being 4000 tons per day.

The mill is electrically driven throughout, and is designed to handle 1500 tons of the crude material daily. It is running three shifts with seven men, including foreman, to the shift, while the mine workings are on two shifts, with 40 to 50 men to a shift. The cost of the underground mining is not higher than that of comparable work on the northern ranges, while the company has no royalties or tonnage tax to pay.

The mill gets its water supply, 1000 gallons a minute, from Iron Mountain lake, about 1½ miles long. It is of the wet, gravity type. One and a half to two tons of crude ore is washed to obtain one ton of concentrates. These have averaged better than 55 per cent iron and less than 7 per cent silica, with a slight trace of sulphur and phosphorus.

The mill received its first tryout in July, 1923, but it was not until May 1, this year, that it was thoroughly tuned

up. The main line of the Missouri Pacific runs close to the plant, and there is a gravity switch with capacity for 50 cars. The distance to Granite City is 90 miles.

* * *

IRON ore in Missouri was first noted by Marquette, in 1673, while he was voyaging down the Mississippi river. Missouri ore was being smelted in that state in 1815, or 29 years before the discovery of ore in the Lake Superior district.

The state has claimed the distinction of being the first west of Ohio to smelt its own iron ore. It once was one of the most important centers of production.

Preferred for High Quality

Pig iron makers in the Pittsburgh district preferred it for its high quality. It was believed the state had enough ore of good grade to meet the needs of the country for many years. In 1870 the Missouri production of 316,000 tons was nearly 10 per cent of the total in the United States. In 1923 the output, 54,348, was approximately 0.08 per cent of the total.

The Lake Superior district passed Missouri as an ore producer in the early 60's.

Up to and including the year 1860 it had mined only 265,517 tons, while the entire output in Missouri up to that year was 410,000. From 1861 to 1869, inclusive, the lake ore production totaled 2,717,724 tons, and the Missouri tonnage, 625,000. Each succeeding year saw great gains for the lake district, over production in Missouri.

The peak of annual output in the southern state was in 1887, with 427,785 tons, and in that year the Lake Superior output was 4,762,107 tons. There followed a rapid decline in mining activity in Missouri, accompanied by a drop in price, and in 1904 the year's output was down to 49,045 tons. The estimated average value per ton then was $1.88, compared with $5 in 1871.

The output in Missouri increased to 116,666 tons in 1905. For five years the annual rate held to about 100,000 tons, followed by another decline. The total for Missouri in the four years of war effort, 1914-1918, was 224,375 tons. All the Missouri iron ore that has been produced to date amounts to about 10,000,000 tons. This is one-sixth of the tonnage shipped from the Lake Superior district in 1923. The output of one mine, the Hull-Rust pit, Mesabi range, in 1923 was 8,800,000 tons.

Ore producers in the Lake Superior district in the last five years have shipped to furnaces in the St. Louis district 900,000 tons. This is about one-third of 1 per cent of all their shipments in that period. The St. Louis furnaces in 1923 smelted a total of 263,000 tons of ore, of which 160,000 tons came from the northern ranges, and the remainder from nearby sources.

Attention recently was called to the fact that 40,000 tons of ore is to be shipped this season from the Baraboo range in Wisconsin to the St. Louis district, on account of the freight rate being 81 cents less than from the other northern ranges. This source is comparatively unimportant. In the past five years the shipments totaled 190,000 tons, or about 20 per cent of all the ore forwarded from the Lake Superior district to St. Louis. Ownership, deposits, and features pertaining to the ore itself are factors.

* * *

WHILE Iron Mountain is favorably situated with respect to deposits, the state of Missouri has other iron ore formations that may be utilized some day.

The brown deposits of the Ozark Mountains are well known to geologists. They are scattered broadly over the Ozarks of the southeastern part of the state, and could be brought into the market in respectable tonnages. Their mining is by wagon and mule, hand picking in small pits; not much anywhere, a few thousand to 50,000 tons, in single deposits, but many of them, and with a large aggregate tonnage.

Large Estimates for Alabama

Attention also has been directed to the possibility of St. Louis furnaces some day being able to draw heavily on reserves in northern Alabama. Periodically, remarkable claims have been put forth regarding the extent of these deposits, and one estimate is as high as 50,000,000,000 tons. Practical furnace operators, however, are not so optimistic with respect to the utilization of these ores at St. Louis. More likely, it is believed, if the ores are to be brought into use the location of furnaces in Alabama would be to greater advantage.

Mine and furnace operators are inclined to discount northern Alabama from the standpoint of St. Louis, first because of the fact a relatively large quantity would have to be handled, unless the ore is first concentrated, and second because of cost of transportation, either by way of the river or rail route. Such predictions as to the course of development in the distant future, in the face of knowledge of large deposits, however, leaves considerable uncertainty.

Promoting Alabama Resources

Interests in the deposits in northern Alabama was revived by the recent incorporation of the Deepwater Coal & Iron Corp., organized as a holding company by a number of well-known southern and northern industrialists and capitalists.

This corporation has obtained mineral rights to 511,000 acres, in which the principal deposits are coal, iron ore and limestone. There are vast water power resources in the district.

Reserves of the red ores, known as the Clinton hematites, in southern states are estimated by geologists at 1,500,000,000 to 2,000,000,000 tons. The United States Steel Corp., Sloss-Sheffield Steel & Iron Co., the Woodward Iron Co., and the Republic Iron & Steel Co., have large holdings in Alabama.

The reserves of available iron ore in the United States are placed by competent authorities as around 5,000,000,000 tons, of which 3,500,000,000 tons generally are credited to the Lake Superior district.

Potential reserves, those which may become available in the future, are estimated by the same authorities as 75,000,000,000 tons, of which 72,000,000,000 are in the Lake Superior district.

A TYPICAL MINING SCENE ON THE CUYUNA RANGE, MINNESOTA, FROM WHICH RANGE CONSUMERS IN THE ST. LOUIS DISTRICT DERIVE A CONSIDERABLE PROPORTION OF THEIR SUPPLIES

Retains Top in Lead and Zinc

St. Louis District Produces Every Year About Half of Country's Output of These Metals—Total Nearly $100,000,000 in 1923—Occupies Important Position in Aluminum, Brass and Electric Manufacture

BY WM. J. NOLLE

WHILE St. Louis territory is increasing in importance as an iron and steel producer, it already enjoys the distinction of being the center of the world's largest lead and zinc producing district. This ranking position in the American metal industry has been maintained for many years. Moreover, all indications point to the ability of St. Louis to preserve this leadership indefinitely.

Last year the value of pig lead and slab zincs smelted from ores mined in territory closely related to St. Louis, was about $85,000,000. To this tremendous sum might be added the value of alumina treated at the East St. Louis plant of the Aluminum Co. of America. All of the aluminum produced in the United States passes through this plant on the way from mines in Arkansas and other southern states to refineries. Therefore, the total value of primary metals produced in the St. Louis district last year can safely be placed well above $100,000,000. In addition, St. Louis is important as a manufacturer of lead and zinc into finished products, and is a large user of copper.

Some of the districts here figured as a part of St. Louis territory are far away as measured in miles, as for example zinc ore produced in northern Oklahoma. But most of the product of such fields passes through the city of St. Louis.

The author is associate editor of Daily Metal Trade in charge of nonferrous metals.

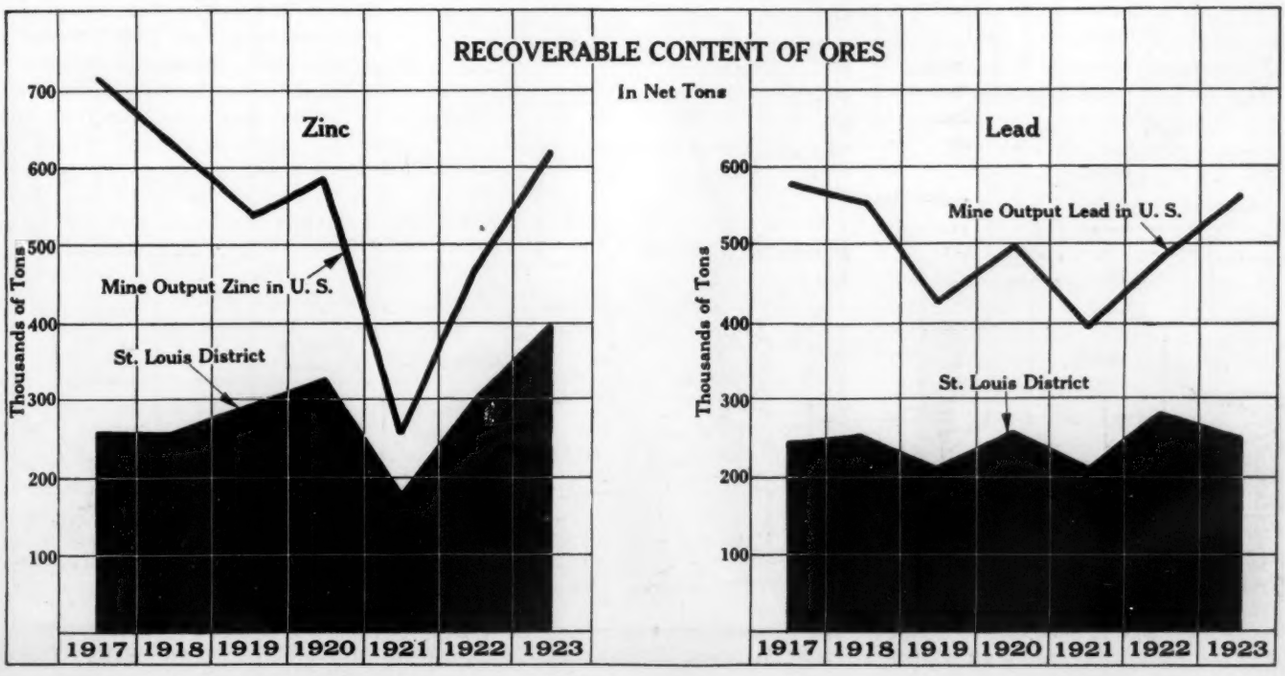
The operations of the properties are directed largely from that city, some of the metal is consumed there and all of it is sold with East St. Louis as the basing point, similar to the use of Pittsburgh as a basing point for steel prices.

Including the Joplin mining district and the zinc mines of Tennessee as a part of the St. Louis area and eliminating the lead and zinc mines centering around Platteville, Wis., this central United States territory last year yielded zinc ore containing nearly 400,000 tons of zinc, out of a total domestic production of 623,000 tons.

In lead production the country around St. Louis relatively is of about the same high importance as in zinc. However, the tonnage is not so great and as the United States imports large quantities of the heavy metal, whereas the imports of zinc have been negligible in the past few years, St. Louis does not hold quite the position in relation to the total tonnage in lead as in zinc. Yet lead is more distinctly a Missouri or St. Louis product than zinc, the bulk of the mining of the district being 60 miles south of the city in and around St. Francois county, while in the plants of the St. Joseph Lead Co., the National Lead Co. and the American Smelting & Refining Co. at Herculaneum, Mo., Collinsville and Federal, Ill., the city has three of the largest and best equipped lead smelters at its doors.

In the smelting of lead and zinc ores St. Louis has approximately the same importance as in mining. Several of the zinc smelters using ores from the district are a little more remote being located in the northern part of Illinois and beyond the Joplin district in Oklahoma, Arkansas and Texas. Several of the most important smelters are in southern Illinois and Indiana, in the coal region that contributes powerfully to St. Louis as a metallurgical center.

The growth of St. Louis as a brass center also is important to the zinc industry and this alloy would benefit from the miscellaneous manufacturing attracted with larger iron and steel production. At East Alton, a few miles from St. Louis, is located one of the most modern sheet brass mills in the country, a class of manufacture that, for many years, was considered primarily as a New England industry. In and near St. Louis are many important brass foundries.



Fuel, Flux and Clay Are Nearby

Illinois Coal, Illinois and Kentucky Fluorspar, Local Limestone and Fire Clay Afford St. Louis Abundant Supplies of Fuel and Secondary Materials—Coking Coal Less Than 100 Miles Distant

BY JOHN D. KNOX

CHEAP fuel takes precedence over all other elements in the development of industry, yet the mere presence of abundant coal, oil or gas does not necessarily fulfill the requirements of an important manufacturing center. The fuel must be of a quality suitable for metallurgical and power purposes, must be readily accessible and easily transported and must be cheap.

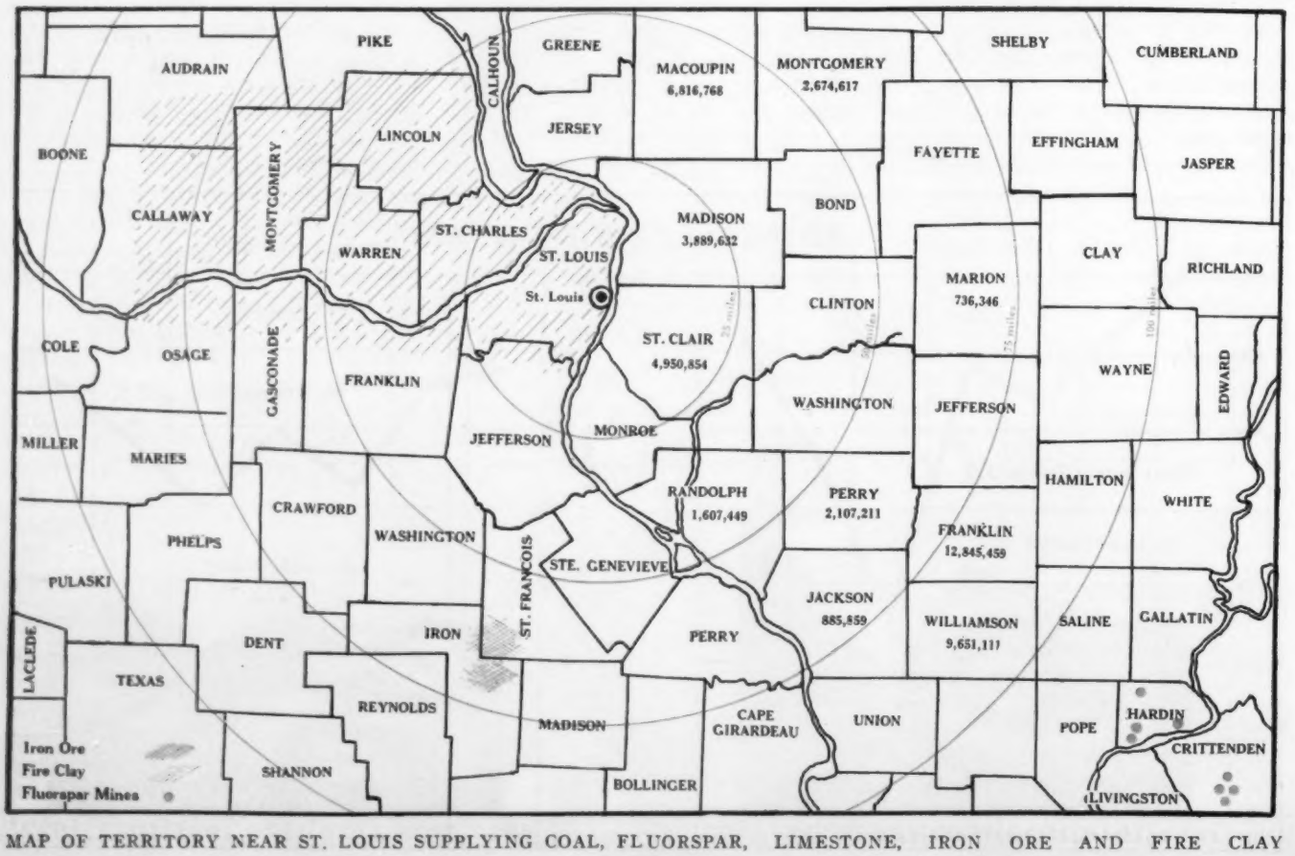
The satisfactory manner in which the coal of western Pennsylvania satisfies these requirements accounts for the preeminence of Pittsburgh as an iron and steel center. Likewise, the degree to which fuel measures up to these tests will determine the industrial growth of the St. Louis district.

No question concerning the abundance of coal is likely to arise. The mines in Illinois within 100 miles of St. Louis now are capable of supplying a demand of 90,000,000 tons per year. Even under the moderate rate of consumption existing in 1923, the counties of Illinois comprising the six districts lying within 100 miles of St. Louis produced approximately 50,000,000 tons or about two-thirds of the entire output of the state. Inasmuch as the St. Louis industrial district consumes less than 10,000,000 tons annually, it is apparent manufacturers need have no concern over the abundance of the supply. The 1923 outputs of Illinois counties within easy shipping distance of the city are shown on the accompanying map.

The author is technical editorial representative at Cleveland of IRON TRADE REVIEW.

Figures on the consumption of coal in the St. Louis district are not available for 1923, but a survey made in 1918 showed that approximately 2,750,000 tons were used on the east side of the river and 4,000,000 tons in St. Louis proper. The total for the entire district was 7,063,180 tons. The principal consuming classes were as follows: Railroads, 25.39; domestic, 28.64; public utilities, 8.31; iron and steel plants, 4.51; foundry and forge shops, 2.52; and clay products, 2.76 per cent. The total industrial consumption was given as 36.10 per cent. A similar distribution based on 1923 consumption doubtless would show an increase in the proportion of fuel used for industrial purposes and public utilities. About 100,000 tons of anthracite coal enters St. Louis annually.

Until early in 1921 the potential possibilities of Illinois coal were not realizer because of the widespread belief that it could not be coked successfully for blast furnace use. On Jan. 20 of that year the first coke was pushed from ovens at Granite City, Ill. and on Feb. 8 a blast furnace was blown in using coke from Illinois coal. The fact that since that time 1,600,000 tons of Illinois coal have been carbonized, producing 1,000,000 tons of metallurgical coke, establishes beyond question the feasibility of



MAP OF TERRITORY NEAR ST. LOUIS SUPPLYING COAL, FLUORSPAR, LIMESTONE, IRON ORE AND FIRE CLAY

manufacturing high grade blast furnace fuel from Illinois coal on a commercial scale.

Although coke has been made from coal received from widely distributed Illinois mines, the most satisfactory fuel comes from Williamson and Franklin counties. Mines in these two counties alone produced 22,000,000 tons in 1923, which indicates the vast quantity of coking coal available.

St. Louis has almost unlimited supplies of coal suitable for other than coke-making purposes practically within sight of the business center. Mines having a daily capacity of more than 100,000 tons are situated near enough to the city so that the so-called inner group railroad rates apply. The fact that several hundred thousand tons are delivered annually by interurban electric lines and motor truck emphasizes the accessibility of coal to the St. Louis market. As shown by the map, St. Clair and Madison counties alone, situated opposite St. Louis, mined nearly 9,000,000 tons in 1923.

Thin seams of coal are scattered taroughout the state of Missouri. In periods of good demand more than 5,600,000 tons are produced annually, Barton and Lafayette counties each accounting for in excess of a million tons. Pockets of coal underlying parts of St. Louis sometimes furnish small quantities of fuel when worked in connection with the mining of fire clay.

St. Louis industrial plants also are favored by their proximity to the mid-continent oil fields, which gives them the advantage of low freight rates on fuel oil. This cheap liquid fuel, which is readily accessible by pipe lines and direct rail routes from Oklahoma and Texas, has been an important factor in the development of the steel casting industries of the St. Louis district.

Limestone, fluorspar and refractories are important secondary materials in the manufacture of iron and steel. As in the case of iron ore and fuel, these lesser essentials are found within a day's rail haul from St. Louis.

Limestone and Fluorspar Abundant

Limestone of high quality for fluxing purposes is obtained within a few miles of the steel plants. It is found at various levels on both sides of the Mississippi and is readily accessible for shipment. According to the United States geological survey 18,890 tons of Missouri limestone was sold for use as furnace flux in 1921, as compared with 89,151 tons in 1918 and 52,300 tons in 1919.

Fluorspar is employed as a flux in making steel by the basic open-hearth process, is used extensively in manufacturing enameled and sanitary ware, vitriolite, etc., and can be used in smelting and refining certain ores. Inasmuch as more than 80 per cent of the fluorspar produced in the United States is consumed in open-hearth steelmaking, a supply of this mineral is an important asset to any important steel center.

St. Louis is nearer to large domestic sources of fluorspar than any other large consuming center for this material. Of the 121,188 short tons mined in the United States in 1923, more than 100,000 tons were taken from Hardin and Pope counties in southern Illinois and Crittenden and Livingston counties, Kentucky. As shown by the accompanying map, these mines are only about 120 miles from the St. Louis industrial district. The principal operators on the Illinois side of the Ohio river are the Hillsdale Fluor Spar Mines, Fairview Fluorspar & Lead Co., Rosiclare Lead & Fluorspar Mining Co. and Webber-Wood Spar Mining Co. In 1923 the mines in Pope and Hardin counties shipped 65,045 tons or more than 50 per cent of the entire output of the country.

Across the river in Crittenden county, mines are operated by the Roberts Fluorspar Co., W. P. Michell, the Ohio-Kentucky Fluorspar & Lead Corp. and the Lafayette Fluorspar Co. The last named producer, a subsidiary of the United States Steel Corp., is developing a property near Mexico, a station on the Illinois Central railroad in the southern part of the county.

The fluorspar used for steelmaking contains 80 per cent or more of calcium fluoride and 6 per cent or less of silica. According to Hubert W. Davis, in the report of the United States geological survey for 1923, reports from steelmakers showed that the consumption of fluorspar per ton of steel produced averaged 8.1 pounds in 1923.

In spite of the proximity of Illinois and Kentucky deposits, the St. Louis district imports fluorspar. In 1923 part of the 10,380 tons imported to the United States from British South Africa was used at East St. Louis in the manufacture of hydrofluoric acid. However, this spar was of the "acid" grade.

Refractories Important Industry

It has been said that refractories constitute the third largest item of expense in iron and steel making. Missouri, with a greater variety of valuable clays than any other state, provides the basis for an extensive refractories industry, which is a valuable asset to manufacturers in the St. Louis district.

Fire clay is found in the district roughly bounded on the east by the Mississippi river, on the north by a line from Louisiana, to Mexico, Mo., on the west by a line from Mexico to Fulton, Mo., and on the south by a line extending eastward from Fulton to the southeastern corner of St. Louis county. The Cheltenham district, lying largely within the city limits of St. Louis, produces an unusually high grade of fire clay.

In this district the material is mined like coal from a depth usually less than 100 feet, shafts and slopes being employed. The thickness of the clay bed varies from one to 12 feet, but most of the mining is performed where the seam is from 3 to 8 feet thick. The Cheltenham and other districts produced 440,728 short tons of fire clay in 1920 and 255,794 tons in 1921, Missouri ranking first among the states in the last mentioned year.

Of the 16 manufacturers of refractories in the state, seven are in St. Louis. It is estimated that in 1923 fire clay products valued at $19,000,000 were manufactured in St. Louis. Aside from refractories, the most important clay products in this district are sewer pipe, terra cotta and pots for glasshouse use.

Missouri's Production of Minerals, 1920

(From U. S. Geological Survey)

	Production	Value
Barytes, short tons ..	99,654	$1,013,570
Cement, barrels	5,605,952	10,980,453
Clay products	.....	17,474,542
Clay, raw, short tons	448,984	1,413,189
Coal, short tons	5,369,565	22,230,000
Cobalt, tons	51	262,801
Copper, pounds	1,512,539	278,307
Iron ore, gross tons.	50,825	230,847
Pig iron, gross tons.	81,682	3,678,623
Lead, short tons....	165,114	26,418,240
Lime, short tons ...	209,113	2,319,285
Natural gas, M cu. ft.	3,800	3,000
Nickel, short tons....	138	103,361
Potash, short tons....	6	1,081
Sand and gravel, short tons	1,909,314	1,356,352
Silver, troy oz.....	111,128	121,130
Stone, short tons	1,457,960	3,518,387
Zinc, short tons	24,509	3,970,458

District Is Favored by Mineral Wealth

	Production	Year
Coal		
Illinois (counties lying within 100 miles of St. Louis, tons..	50,000,000	1923
Missouri, tons	3,800,000	1923
Iron Ore		
Missouri*, tons	53,546	1923
Limestone for Fluxing		
Missouri and Illinois**, tons	85,000	1923
Fluorspar		
Illinois, tons	93,845	1923
Kentucky, tons	44,483	1923
Fireclay		
Missouri	440,728	1920

*From May 1, 1924 to July 1, 1924, about 50,000 tons of ore was shipped from the Iron Mountain properties, indicating that at that rate the ore output of Missouri for 1924 will be several times that of 1923.

**Estimated. The output of limestone for fluxing in Missouri alone varies between 18,000 and 90,000 tons annually. The estimate is for local production near St. Louis.

Taps Richest Scrap Store in Country

BY GEORGE H. MANLOVE

WITH increasing utilization of iron and steel scrap in the making of pig iron and steel St. Louis occupies a position not excelled by any producing center in the country. This important raw material, which constitutes 40 to 60 per cent of the melt of the average open-hearth furnace in the steelworks, as high as 95 per cent of some foundries and is an important element in blast furnace practice, is available to St. Louis users at lower cost than to practically any other locality in the country where iron and steel production is conducted on an important scale.

From the great area to the south and west, an evergrowing consumer of iron and steel, comes a steady stream of iron and steel scrap and vast reservoirs collect there to be tapped whenever need arises and prices are sufficiently high to call it forth. No other user stands between St. Louis and this great supply that passes to the East through the St. Louis gateway and into which its industries dip to provide for their scrap needs. From its geographical position, iron and steel scrap at St. Louis costs several dollars a ton less than at points further East.

Scrap flows in a direction opposite to steel products. Steel is produced most heavily in eastern territory and moves to consuming points in the West. So small a proportion of the country's steel is produced west of St. Louis that it is almost negligible. Yet the entire country west of that city is a consumer of steel and iron in every form. Every pound of metal is a prospective candidate for the scrap pile and these accumulations move back to the steel-producing centers of the East, largely through St. Louis. Its value at the point of origin is relatively small, dependent in a large degree on the freight rate to some point where it can be utilized. Value depends on availability for use and that availability is gaged entirely by the cost of transportation. As the West and Southwest grow in population the use of steel and iron increases, the resulting tonnage of scrap increases constantly and the volume passing through St. Louis for eastern destinations is larger each year.

The author is associate editor at Cleveland of IRON TRADE REVIEW.

Three important gateways handle practically all the scrap which moves from west to east; St. Louis that from the Southwest, St. Paul and Minneapolis from the Northwest; and Chicago from the West and from the other two centers. With a heavy excess of supply over consumptive requirements and a large freight charge necessary to carry the scrap further east where it is needed, it is an easy matter for steelmakers in the St. Louis district to obtain all the tonnage they require at prices considerably below those paid by Pittsburgh consumers. Thus the steelmaker at St. Louis has a material advantage in the cost of this important item.

Authorities in the scrap industry who are conversant with the situation in the West estimate that practically 50 per cent of the scrap produced in the United States comes from west of a north and south line passing through Chicago. This would indicate that nearly that much comes from west of St. Louis, a large portion of which passes through St. Louis to reach a market there or further east. At the same time it is estimated that only 25 per cent of the western scrap is consumed west of the line referred to, and most of this consumption is at St. Louis, aside from the small percentage used in foundries scattered through western states.

It is true that wherever there is an excess of any material over the needs of the locality the price is beaten down and conversely the locality in need of more material than it produces is forced to bid for its supply. This is especially true of iron and steel scrap since railroad rates have advanced so materially in the past few years that long hauls on account of transportation cost, are discouraged economically.

This insures to the advantage of the western consumer. Consequently St. Louis can obtain its supply of scrap at a less cost than Pittsburgh's, amounting to 50 or 60 per cent of the freight to Pittsburgh.

With more than a score of railroads entering the city large tonnages are offered from that source. Since railroads produce about 40 per cent of all the scrap marketed in this country, this constitutes an important source. With markets lacking in western territory the railroads carry their scrap to their easternmost terminals and there offer it to dealers and consumers. This gives St. Louis first call on the scrap offerings of a number of important western lines and provides a constant supply from which to fill all needs. Additionally all the tonnage gathered by country dealers in the great and growing Southwest converges at this point and supplies other grades than the railroads furnish. Industrial scrap is not as important an item in the West as in the East but sufficient is produced beyond St. Louis to provide assortment of grades for all needs.

Estimates as to definite tonnages of iron and steel scrap are difficult to make and to sustain. So many variables enter into the situation at any time that figures of one year are widely different from another. With railroads busy and prosperous, larger campaigns of track and rolling stock replacement are undertaken than in times of slack business. When steel mills are running at full capacity to supply the needs of industry industrial scrap is produced in larger

measure. With prices at a profitable level country dealers collect more closely and have a larger supply to offer.

However, it is estimated that in an ordinarily prosperous and busy year, with 20,000,000 tons of scrap representing the total volume for the entire country, fully one-half that total comes from west of Lake Michigan and close to 3,000,000 tons pass into St. Louis, either for use there or to be sent east. It is probable that fully 500,000 to 700,000 tons of this is consumed in St. Louis and its adjacent metal producing centers. These figures are conservative and indicate the importance of St. Louis in the market movement of scrap. They balance well with the tonnage of steel turned out in the St. Louis district and probably are fairly close to the truth for an average year. The supply of scrap is second in importance only to iron ore and fuel.

On the basis of 610,000 tons of scrap used in the St. Louis district in a year as estimated by one authority, the tonnage is distributed about as follows: steel plants, 400,000 tons; rails for rolling, 60,000 tons; rolling mill grades, 100,000 tons; miscellaneous grades, 50,000 tons.

The relative cheapness of iron and steel scrap compared with pig iron is greater at St. Louis than at Pittsburgh. At one time heavy melting steel scrap was higher than pig iron at Pittsburgh and at the same time it was $6 per ton below pig iron at St. Louis. This was an extreme but the same thing is true in less degree much of the time.

Evidence of the relative cheapness of scrap at St. Louis is found in quotations presented each week by IRON TRADE REVIEW. Reference to these shows a difference of $3 to $5 per ton between St. Louis and Pittsburgh on various grades and a somewhat less differential under the Chicago prices.

In addition to grades of steel for remelting and for the production of new steel, another utilization of worn material is found in the rerolling operations of an important industry. Steel rails that have passed usefulness as such are heated and rerolled into small bars and shapes while old car axles are heated and rolled like new billets constituting a high grade of material, both steel and iron. These uses of scrap account for a large tonnage of rails and axles being absorbed in the St. Louis district, where several rerolling plants are located.

Strategically St. Louis could ask no better position as to this class of raw material, brought to her very doors by the force of circumstances, where it may be purchased more cheaply than in any other consuming center, and in an abundance that always assures a full supply.

Steel Industry Moving Westward

(*Concluded from Page* 4)

2.18 per cent; Alabama, from 2.30 per cent to 1.62 per cent; New Jersey, from 0.75 per cent to 0.43 per cent; Massachusetts, from 0.59 per cent to 0.23 per cent and Connecticut from 0.32 per cent to 0.16 per cent. Other states showing a loss which had come into the field as producers since 1904 were Georgia, from 0.33 per cent to 0.23 per cent and Washington, from 0.20 per cent to 0.16 per cent.

The only two eastern states to record a gain in percentage from 1904 to 1924 were Maryland, from 2.48 per cent to 2.76 per cent, and Delaware, from 0.67 to 1.44 per cent.

Several factors of major importance largely have been responsible for the very perceptible drawing of the steel industry westward, during the past few years. All have been of a distinctly economic character. The first has been that of markets and consumption. General manufacture offers a wide channel for the use of steel for which it constitutes the raw material for fabrication and transformation into articles of common use. The manufacturing industry in the United States has been concentrating in the middle western states at an even greater rate than steel production. In 1920 the center of manufactures was the central western part of the state of Ohio. In the 70 years from 1850 it had moved to this point by steady stages from central Pennsylvania, a distance of substantially 329 miles. During the same period the center of population had progressed westward, a distance of 290 miles. This indicates that the movements of general manufacturing and of population are closely related.

Within an area bounded by the northern limits of Massachusetts and extending to the Mississippi river on the north and from the southern line of Delaware to a few miles west of St. Louis on the south, is carried on the bulk of the primary distribution of steel in this country. It is estimated that probably two-thirds of the tonnage passed on by the mills to the home market goes to initial buyers in this territory. This is due, among other things, to the fact that the manufacturing industry of the country overwhelmingly is located within this area. Likewise, about 50 per cent of the population of the country is to be found there. Steel production from its nature is strongly affected as to location by the industry that consumes it. Likewise, availability of steel attracts to it other industries so that the process of expansion in a growing center is accelerated. To this now is added, the high freight rates, the effect of which is to limit the operations of industry into zones. A rough approximation indicates that the Pittsburgh district supplies practically 30 per cent of the normal steel requirements of this great buying or consuming territory, Chicago 20 per cent, Cleveland and Columbus districts 10 per cent, Mahoning valley 10 per cent and eastern steel plants 15 per cent. The St. Louis district furnishes probably 2 per cent.

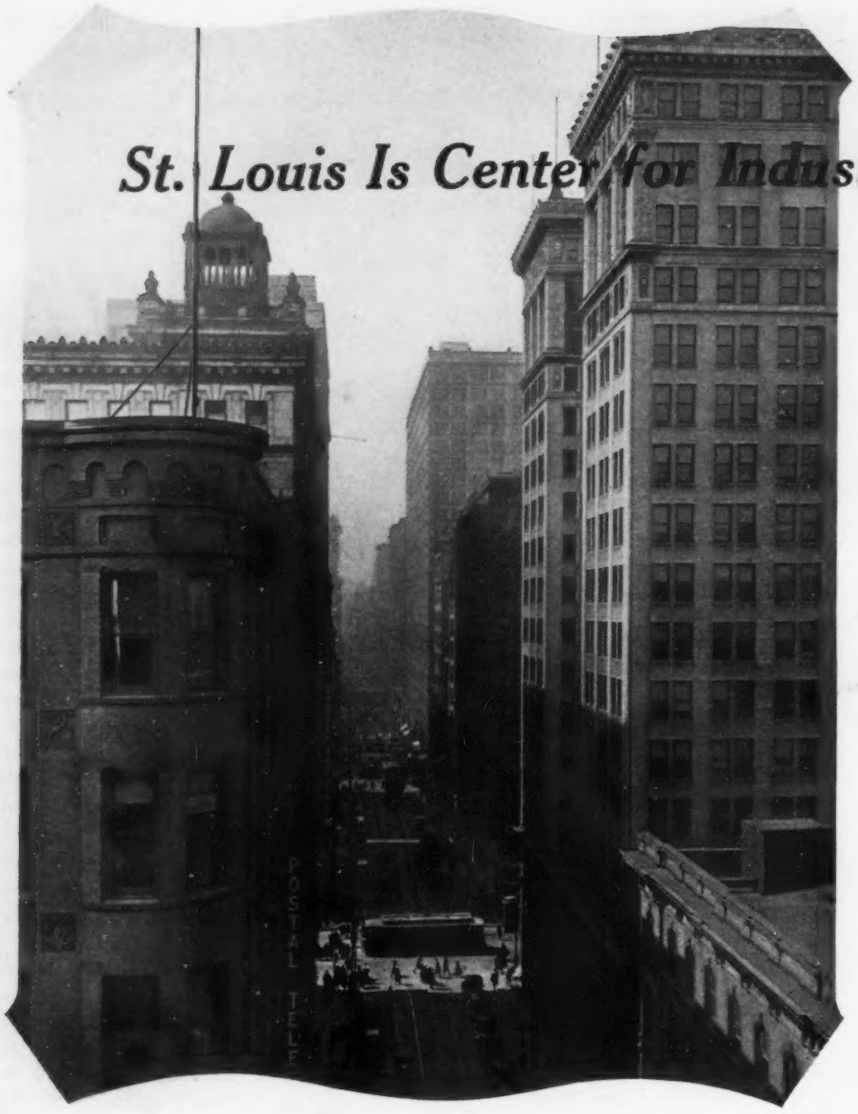
Obviously, the density of population is a factor which exerts a very definite force upon the trend of steel development. Steel, as the universal metal of presentday civilization, receives a strong influence from that territory where the distribution of general population creates the greatest consuming power. In the westward movement of both population and manufacturing, the latter constantly has remained a considerable distance behind the center of population. In 1850 when the center of manufacturing was in central Pennsylvania, that of population was southeast of where is today, or near, Parkersburg, W. Va. This point was 240 miles southwest of the center of manufactures. The gap between these two centers has gradually narrowed until in 1920 it represented approximately 200 miles. The center of population in 1920 then was located in the southwest section of Indiana. During the past 20 years its rate of progression has materially slackened, the total advance in that period amounting to 48.6 miles. In the same period the center of manufactures moved 75.9 miles.

Consuming power and markets, however, probably have not had as much effect upon the shaping of the American steel industry in recent years as the accessibility of raw materials such as fuel and iron ore. Of these two materials, fuel has been the more potent factor. Usually, the ore has gone to meet the fuel. This is due probably to the fact that the availability of metallurgical fuel has been much more restricted than that of iron ore. Pittsburgh established its preeminence in the industry because of the affinity of the ore for the fuel. During the past 20 to 30 years, the overwhelming domination of the iron and steel industry as to iron ore by the Lake Superior deposits, has tended to modify or neutralize the attraction of coking coal. This has more and more directed the geographical course of new iron and steel works construction. The development and widespread adoption in recent years of the by-product method of coking coal which materially has broadened the sources of supply of suitable coal, has been a big factor in increasing the relative importance of the location of iron ore in the steel equation.

St. Louis Is Center for Industrial Financing

Holds Prestige Gained Years Ago in Extensive Commercial Relations

BY J. VION PAPIN



In the heart of the St. Louis banking and financial district, looking west on Olive street from Fourth street

SINCE the period immediately following the Mexican war, St. Louis in its strategic relation to the West and Southwest has been the chief gateway through which have passed materials and money for developing those vast regions. The age and wealth of the city, as much as its geographic location, constituted a factor in turning the eyes of the pioneers who built the great southwestern empire upon the Missouri metropolis, and making it the center of supply for the things needed in the growth of the new country.

With the passing of the years St. Louis has held the prestige it gained through its early commercial and financial relations with the Southwest. New enterprise in that territory has invariably turned to St. Louis for its financial sinews.

Many of the principal railroads of the Southwest were financed with St. Louis capital, as have, in more recent years, its tremendous drainage and irrigation projects and its manufacturing undertakings. From the beginning, business men of St. Louis have realized that to perform the functions expected of the city and to take full advantage of opportunities, adequate banking facilities are essential.

The first settlers of St. Louis were fur traders, an energetic and resourceful group. Their first currency consisted of beaver, otter, raccoon, mink, buffalo and deer skins, beef hides, bacon, beeswax, country-made sugar, whisky and lead. On a basis of fur money they developed a financial system which was simple and served its purpose well. What little gold and silver they possessed was hoarded up to pay debts, and to supply its place in making change "barter currency" was used. It was a number of years before the evolution of the community, in which was included the growth of agricultural pursuits, necessitated a more modern method of exchange and finance.

Bank Clearings Have Steady Growth

1923	$7,203,667,000
1922	6,718,209,000
1921	6,234,888,000
1920	8,294,027,000
1919	8,201,532,000
1918	7,838,846,000
1917	6,967,495,000
1916	5,370,977,000
1915	4,153,529,000
1914	3,888,851,000
1913	4,136,994,000
1912	4,027,580,000
1911	3,859,681,000
1910	3,727,949,000
1909	3,442,439,000
1908	3,074,806,000
1907	3,165,619,000
1906	2,972,653,000
1905	2,899,798,000
1904	2,793,233,000
1903	2,510,479,000
1902	2,506,804,000
1901	2,270,680,000
1900	1,688,849,000

The more prominent citizens began to accumulate wealth, upon which has been based many of the large fortunes in St. Louis today. To invest these accumulations it became necessary to seek beyond the borders of the city, and in order to handle the financing there was need for banks. Merchants traveling by horseback from Missouri to Philadelphia could not risk their money by carrying it along with them, and it was obvious that credits must be established in the cities where trading was done.

In 1816 St. Louis boasted of a business capital of $1,000,000, and in that year the first financial institution, the Bank of St. Louis, was founded. A year later the Bank of Missouri was organized with a capital of $250,000. In the precarious banking and business conditions of the times, however,

these pioneer banks failed to prosper, and within five years of their establishment, both had disappeared with heavy losses.

There followed a period of private banking, conducted by the best class of men in the community, but despite their integrity there were many failures, and more reliable and solid financial institutions became the principal need of the rapidly growing city. It was evident that commerce and expanding industrial activities could not thrive unless adequate machinery was set up for handling the financial side.

Financed Mineral Development

The necessary capital and wealth were not lacking, but they had been earned at great cost and the possessors wanted assurance relative to the permanency of the agencies which handled them.

In response to these demands there were organized within a relatively short period a group of banks, equipped in every way to handle the financial requirements of the community as they developed.

The success of the new institutions during their initial years established clearly that the era of failures had passed, and hoarded capital came into view in the form of deposits and funds for investment. Some of the banks existing today trace their history in unbroken sequence to the small institutions which were founded at that time.

In 1910 there were eight banks which had continuous existance of over 50 years, their dates of organization ranging from 1847 to 1857. Some of these have since been absorbed in the consolidations which formed the city's major banks of today, but at least three still exist as independent institutions.

Among the important undertakings of St. Louis financiers in the early days were the development of the lead and zinc fields of what is known as the tristate district of Missouri, Kansas and Oklahoma. Before the days of railroad transportation properties of this field were being worked by St. Louis capitalists.

The zinc and lead ores then were mined and carried in wagons to the Mississippi river or one of its tributaries for shipment, by water to New Orleans and thence to Europe for reduction, and later to the smelters erected near St. Louis. For several generations these rich mines have been an important source of wealth to St. Louisans.

St. Louis capital financed the Iron Mountain mine in St. Francois county, which prior to the discovery of iron ore in the Northwest was the largest in this country. The ore was shipped overland to the Mississippi river and moved to the furnaces in St. Louis by boat. But this method of transportation was found to be slow and inadequate, and led to the building of the Iron Mountain railroad, the first great railway system constructed and financed by St. Louis capital.

Shortly thereafter commenced the period of railroad building in the Middle West, and St. Louis capitalists played an important part in organizing and financing all the systems centering in the city.

Among the many well-known railroads which were built largely with funds raised in St. Louis may be mentioned the Missouri Pacific, the St. Louis & San Francisco, the St. Louis & Southwestern, the western lines of the Wabash, the Missouri, Kansas & Texas, sections of the Burlington system, and the Mobile & Ohio. With the completion of the Southwestern lines the position of St. Louis as the main gateway to that region was firmly established, and the strategy of the early builders has been vindicated by fact that the city enjoys transportation advantages today second to none in the country.

Before the days of railroads, however, St. Louis was prominent as a shipping point, it being the chief port north of New Orleans for steamboat traffic on the Mississippi river. In the heyday of steamboating the finest boats and packet lines were owned by St. Louis capitalists, and large fortunes were accumulated in the building and operation of Mississippi river boats. Tremendous impetus was given to the manufacturing and general industrial activities of the city by the fact that it possessed at its levee the best existing facilities for shipping finished goods and bringing in raw materials.

Drainage and Road Projects Aided

Another outlet for St. Louis capital, and a source of wealth to its citizens, were the bituminous coal fields in Illinois. A large portion of the mines in the richest counties of southwestern Illinois are owned and operated by St. Louis companies and individuals. The same is true in lesser degree relative to the coal properties in Missouri and Arkansas, whose development in recent years has been an important factor in the fuel supply of the Middle West.

During the past decade enormous investments have been made from St. Louis capital in the extensive irrigation and drainage enterprises which have reclaimed lands in the Mississippi valley from the mouth of the Missouri river to the Gulf of Mexico. Through banks and brokerage houses large issues of drainage and road bonds have been marketed. St. Louis capital found investment in similar enterprises farther west than the Mississippi. The largest irrigation project of the Rio Grande valley in southern Texas was promoted and entirely financed in St. Louis.

Influx of New Industries

These outside financings, however, have never been at the expense of local demands, as it has been the boast of St. Louis, and with excellent reason, that no city in the United States has financed its own enterprises with local capital to a greater extent than the Missouri metropolis. Foreign landlordship is considerably less evident in St. Louis than cities further east or on the Pacific coast. The reason for this may be traced to local pride, and more directly to the general disposition of the citizens to put their money in investments which are near enough to overlook.

Something more than 38 per cent of the residents of St. Louis own their own homes. Since the World war there has been an enormous influx of new industries, which have brought in much outside capital, but prior to that time St. Louis industries were largely owned at home. Potentially there is enormous wealth in the city, vastly more than is indicated by the current reports of its many important financial institutions.

Within the corporate limits of St. Louis there are 52 banks, large and small, 15 of which are members of the Clearing House association. Total resources of the associated banks and trust companies of St. Louis at the last official call of the comptroller of the currency were $592,631,749. A federal reserve bank is located in St. Louis, and under the federal reserve act, St. Louis was designated as a central reserve city. Credit is abundant, not only for the routine commercial demands and the tremendous annual movement of crops, but for new enterprise. The proverbial conservatism of St. Louis, which for the past half century has been accountable for the low percentage of banking mortality, still is in evidence, but in recent years has been tempered with a considerable degree of liberality in fostering new enterprise. The banking facilities are on a parity with those of the largest cities of the country, and fully adequate to meet every requirement of modern commerce and industry.

Geographic Location Gives St. Louis District Low Rail and Water Freight Rates

BY E. F. ROSS

New St. Louis municipal dock and fleet of government barges

INDUSTRIAL leaders are exercising more concern in the question of distribution today than at any time in the history of the country. On certain commodities the carrying charges exceed the cost of material and labor consumed in manufacture. In many cases the length and cost of haul erect economic barriers, shutting off profitable markets as effectively as if they did not exist.

Naturally under these conditions, industries gravitate to cities strategically situated in relation to their transportation requirements. In some cases, it involves a move to a point nearer the source of raw materials. In others it means shifting the base of operations in closer proximity to the consuming district. With the majority of manufacturers the problem resolves itself to one of balancing the cost of assembling raw material with the expense of delivering the finished product.

St. Louis claims numerous important transportation advantages. To the industry seeking a new location, it says: "F.O.B. St. Louis means a shorter haul." Its apt slogan, "Ship from the center—not the rim" expresses the same thought in another way.

The author is technical editorial representative at Cleveland of IRON TRADE REVIEW.

Is Centrally Located

In order to grasp the significance of these statements, it is well to consider the city's geographical position from a distant perspective. Measuring west from the Atlantic coast, it stands at about one third the distance to the Pacific. On a meridian, it lies midway between the Canadian border and the Gulf of Mexico. An imaginary straight line drawn from Mobile, Ala., through St. Louis to the northern limit of Minnesota practically divides the metalworking producing area of the United States from the nonproductive territory.

St. Louis stands as the gateway of communication between the two. Thus situated, the city enjoys a geographical advantage possessed by few, if any large cities. It holds the key to the distribution arteries in the heavy consuming petroleum, mining and agricultural districts of the Southwest. It is nearer to the Gulf states than any other large industrial city of the North. And yet, while being accessible to these great metal consuming but nonproducing fields, it still is near enough to the concentrated centers of population and industry of Illinois, Indiana, Ohio and western Pennsylvania to successfully ship many products in competition with manufacturers in those states.

The short haul gives the city certain rate advantages over many other distributing points. Practically two-thirds of the area of the United States, which may be described as that part lying southwest of a line drawn roughly from Charlestown, S. C., to Spokane, Wash., enjoys a lower freight rate from St. Louis than from either Chicago or New York.

The short haul and corresponding low freight rates over a wide territory are advantages accruing to St. Louis because of her good fortune in being centrally located. The benefits of a second factor, namely service, comes to the city, not through any stroke of favor, but because St. Louis has been active in capitalizing on its physical transportation assets.

The terminal facilities of the city are unusual. Fifteen trunk-line railroads have combined and pooled their interests and credit in what is known as the Terminal Railroad Association of St. Louis, which operates and controls all of the terminal activities in the St. Louis industrial district. The Union passenger sta-

tion, two Mississippi river bridges, three belt lines on each side of the river connecting 28 railroads, three river docks, and numerous freight houses and teamyards are under its direction. The centralized authority does away with duplication of effort, greatly reduces delays in handling traffic and practically insures for the patron of any one railroad, the benefits of all.

It is a noteworthy fact that while the present facilities are considered a model by many transportation experts throughout the country and commissions from other American cities frequently visit St. Louis for the purpose of obtaining ideas in operating terminal facilities, the railroads affiliated with the St. Louis Terminal Railway association are considering the expenditure of practically $100,000,000 in further improving the properties under control of the association. The proposed changes will expedite the handling of all kinds of freight, eliminate numerous grade crossings, lessen confusion in the interchange of cars and relieve congestion in certain parts of the city.

Expedites Package Car Shipments

Another development that has had an important influence on the prompt delivery of freight distributed from the city, is the St. Louis package car system, which was developed by the traffic bureau of the St. Louis chamber of commerce. As described by D. W. Coyle, traffic commissioner, it embraces the movement of from 1000 to 1200 package cars sealed at and forwarded from St. Louis daily. These cars are consigned to over 500 important break-bulk points throughout the United States. These cars contain less than carload shipments from various consignors to various consignees for consumption at the break-bulk point or for distribution therefrom to nearby stations. A committee of five, representing the shippers of St. Louis, known as the "routing committee," meets once a week with the traffic bureau of the chamber of commerce for the purpose of determining the most available and expeditious routes for handling shipments from St. Louis to every railroad station in the United States. This committee considers all phases of the package car service and gives to the Shippers' Guide Co. for publication in looseleaf form, full information as to the proper routing to be observed in order to obtain the best service. This guide, now used by the shippers of St. Louis, enables the shipping clerk of any company to determine the railroad to which a shipment should be delivered in St. Louis in order to reach any point in the United States in accordance with the suggestions of the routing committee.

Through this package car system points within a radius of 300 miles are reached overnight. Points in a zone roughly formed by Mobile, Alabama, Pittsburgh, Erie, Pa.; St. Paul, Omaha, and Tulsa, are reached in two days. Within three days Duluth, New York, New Orleans, Dallas, and corresponding points are reached.

Rivers Offer Bright Possibilities

Although the rail-borne freight facilities in St. Louis are extraordinary, the possibilities for the extension of water shipment from that city also are bright. Standing midway between the source and mouth of the great Mississippi river, St. Louis is served by one of the most extensive inland waterways in the world. This system includes the Mississippi river northward as far as St. Paul and Minneapolis and southward to the Gulf of Mexico; the Missouri river to its navigable limits; the Illinois river from its mouth to Utica, Ill., and eventually to Lake Michigan via canal; the Ohio river from Cairo to Pittsburgh with parts of its tributaries, the Allegheny and the Monongahela, and the Tennessee, Cumberland, Arkansas and other smaller rivers.

The extent of the ultimate development of this inland water highway cannot be foreseen. If advantage is taken of the rivers in this country as it has been taken of smaller streams in Europe, the Mississippi and its tributaries are bound to carry an increasing amount of trade each year.

In 1923 the federal barge service, generally known as the Mississippi-Warrior Barge line, transported 710,000 tons of freight, more than half of which was handled in connection with rail hauls. J. C. Colwell Jr., writing in the June issue of the *Mississippi Valley Magazine*, presents the following figures showing the tonnage of freight carried by the barges last year and the points of origin or destination:

Territory	Southbound Tonnage	Northbound Tonnage
St. Louis	231,412	57,041
Chicago district	40,677	40,464
Indianapolis	1,501	7,143
Kansas City, Mo.	342	3,276
Martins Ferry, O.	2,412	
Cairo, Ill.	2,250	2,978
Memphis	35,298	23,608
Little Rock, Ark.	385	852
New Orleans	407,558	230,001
Pacific Coast	20,392	2,801
Florida	9,737	
Europe	306,285	4,024
West Indies	10,895	47
South America	170	21,599
Central America	385	371
Africa	826	
Hawaiian Islands	113	
Asia	21,725	
Mexico	12,843	14,588
India		40,876
Cuba		524

These figures illustrate the availability of the service to interior points as well as to cities situated on the rivers.

Mr. Colwell also outlines the equipment of the federal barge line, stating that the service has passed the stage of experimentation and is entrenched as a marine enterprise. The equipment consists of 12 tow boats, three 2000-ton self-propelled barges, 19 3000-ton barges, 45 2000-ton barges, two 1000-ton barges and 12 500-ton barges. These 81 barges have a combined cargo capacity of about 131,000 tons.

For service between St. Louis and Cairo four tow boats are used, namely the MINNESOTA, MISSOURI, IOWA and ILLINOIS. These power units are designed especially for service in shallow water and draw between 3½ and 4 feet.

Lower River Service

From Cairo to New Orleans, twin-tunnel screw tow boats are used. These units are slightly smaller than the upper river boats but are more powerful and draw about 7 feet of water. The tow boats in the lower river service are the VICKSBURG, MEMPHIS, CAIRO, ST. LOUIS, NATCHEZ and BATON ROUGE.

The distance from St. Louis to New Orleans, the terminals of the line, is 1163 miles. The scheduled southbound trip consumes 115 hours. The rail-river rate allowed by the interstate commerce commission is 80 per cent of the corresponding all-rail rate.

In addition to the St. Louis-New Orleans freight run, the government operates an express line between St. Louis and Memphis. Self-propelled barges leave the Missouri city on Fridays, arriving in Memphis Mondays. Three independent companies operate service between St. Louis and St. Paul; St. Louis and Peoria and Cape Giradeau and intermediate points, and St. Louis and points on the Tennessee river.

Recently the government barge line has made arrangements for the interchange of river freight with two ocean steamship lines, giving St. Louis a measure of the advantages of a seaport.

Freight Handled in St. Louis District, 1923

Railroads entering St. Louis on own rails:	
Trunk lines	19
Coal roads	5
Switching roads	4
Freight received in 1923:	
By rail, local tons	29,044,649
By rail, through, tons	23,347,856
By water, tons	144,880
By rail, East side, tons	37,363,320
By rail, West side, tons	15,029,185
Freight transferred across Mississippi river in 1923:	
West to east, tons	12,261,304
West to east, cars	411,113
East to west, tons	14,134,316
East to west, cars	442,313
Freight received by river in 1923:	
Upper Mississippi, tons	22,050
Lower Mississippi, tons	110,495
Illinois river, tons	10,865
Ohio, Cumberland and Tennessee rivers, tons	1,470
Total tonnage handled by railroads in St. Louis district, 1923	**88,000,000**

Value of Manufactures of Leading Cities from 1919 Census

(By Cities)

City	Number of Establishments	Value of Products
New York	32,590	$5,260,707,577
Chicago	10,537	3,657,424,471
Philadelphia	9,064	1,996,481,074
Detroit	2,176	1,234,519,842
Cleveland	2,946	1,091,577,490
St. Louis	3,205	871,700,438
Baltimore	2,797	677,878,492
Buffalo	2,093	634,409,733
Boston	3,077	618,921,962
Pittsburgh	1,875	614,726,978

By Industrial Districts

	Number of Establishments	Value of Products
New York, including Hudson, Union and Essex counties, N. J.	38,070	$7,163,477,840
Chicago, including Cook County, Ill. and Lake county, Ind.	11,647	4,428,715,869
Philadelphia, including Philadelphia and Delaware counties, Pa. and Camden county, N. J.	9,794	2,498,240,424
Detroit, including Wayne county. (Figures for Windsor not available)	2,377	1,975,599,670
St. Louis, including St. Louis county, Mo., and St. Clair and Madison counties, Ill.	3,971	1,358,839,480
Pittsburgh, including Allegheny county	2,655	1,347,745,164
Cleveland, including Cuyahoga county	3,132	1,158,921,941

Diversity of Industries Is Asset

Large Number of Plants in Widely Separated Branches of Metalworking Industry Give St. Louis Stable Foundation for Future Growth—Present Position Attained by Slow Development—Foundry Products Important

BY E. L. SHANER

FACTORS likely to help shape the future of St. Louis having been discussed in the foregoing articles, the question naturally arises as to how these influences have affected its development up to the present time. Are the city's industries daily reaping the reward of its manifest advantages of good transportation, cheap fuel and materials, and abundant labor? Under these favorable conditions how far has the St. Louis district advanced toward leadership in the various branches of the metalworking industries?

The answers to these and related questions can be developed most logically by analyzing the character and extent of St. Louis manufactures. Most of the companies in and near the city fall conveniently in two classifications. In one group are the older institutions which by the time of the World war had become firmly entrenched. The history of many of these companies dates back to the early days of the city. They were founded by pioneers who settled in St. Louis either through circumstance or because individually they sensed its opportunity for future industrial growth. From modest beginnings, many of these concerns progressed gradually and surely until at the time of the World war, they were able to contribute in a large way to the material support of the United States and allied European military forces. These companies represent the backbone of St. Louis industry, and it is on their ability and strength that future developments will be based.

The author is engineering editor of Iron Trade Review.

The second and smaller group includes about 30 companies which have established plants in the St. Louis territory within the past five years. Most of these concerns were attracted by the tangible evidence accumulated during the war period of the importance of the markets, distributing advantages and low assembly cost of the districts.

The acquisition of these new industries by St. Louis also was influenced by a rejunevated civic spirit which was just beginning to burst into being. The smoldering embers lay in the sturdy character of the older group of manufacturers, awaiting only a spark to give them life. This spark was provided by the timely discovery that the so called non-coking Illinois coal could be coked successfully. Fanned by civic pride, the flame for four years has been transmitting it light to all parts of the world, beckoning industries to the city.

The community feeling of the citizens of St. Louis is deserving of more than passing mention. It is more than a glib figure of speech designed for advertising purposes. It has life, breathes inspiration and is a force which becomes more real and more impressive the closer one comes to the thoughts and ambitions of the leading excutives. A civic spirit has to be more than a by-word to enable a community to vote $87,000,000 for improvements as the people of St. Louis have done. It has to be real and of practical value to induce business men to back their chamber of commerce as St. Louis business men are doing. It has to have force to drive busy executives to give liberally of their time and ability to study the city's problems and lay plans for developing bet-

The new 22-inch mill of the Scullin Steel Co. is representative of recent expansion in the rolling mill capacity of Greater St. Louis plants, stimulated by growing markets in the Southwest.

ter home life, expanding industries and unifying public utilities as executives are doing in St. Louis.

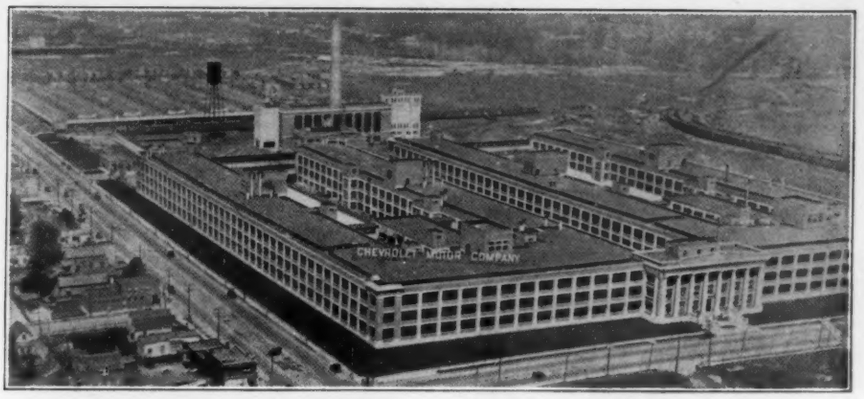
While a visitor in the city cannot escape the evidence of the St. Louis spirit, he can understand it better if he talks with a few of the leading manufacturers. He will find, as the writer found, an unvarying attitude of loyalty to the community and firm faith in its future. While opinions differ somewhat on the importance of certain factors affecting industrial developments, there is no lack of harmony on the main issue, which is making a greater and better St. Louis. The enthusiasm displayed would not be unexpected in the case of a small city where it is relative easy to stir up civic pride. That the spirit has thoroughly permeated a community of a million persons is remarkable. It has no parallel in any other large American city.

* * *

REGARDLESS of any future development, St. Louis today holds commanding position among the leading manufacturing centers of the country. Figures compiled for 1919 by the United States bureau of the census give the city sixth place in the value of manufactured products and fourth rank in the number of establishments. However, when industrial areas surrounding the various cities are included as accurately as is possible by using the census bureau's reports by counties, St. Louis advances to fifth place in value of products.

In addition to showing the strong position of the district, the accompanying table affords an explanation of the stability of its industries. The Missouri city and its suburbs are credited with 3971 establishments as compared with 2377 in the Detroit district and 2655 in Pittsburgh's manufacturing area. This means that whereas Pittsburgh and Detroit hold their high rank by virtue of the great steel and automobile establishments, respectively, St. Louis owes her standing to a large number of smaller industries. Her strength and stability lie in the diversity of her manufactures.

This lack of dependence on any one or



Situated in a well planned new industrial section in the northwest section of the city of St. Louis, this new plant of the Chevrolet Motor Co. stands as one of the most important acquisitions to the industries of the district.

two predominant branches of industry is due largely to the manner of the city's development. It was founded in 1764 by Pierre Laclede Liquest, who established a base for trading with the Indians. Its first important business was in fur, the Missouri Fur Co. and the American Fur Co. beginning operations early in the nineteenth century. The first iron was made about 1814 and by 1830, several foundries and shops manufacturing wagons and tires were prospering. The advent of the first railroad in 1849, and the utilization of Iron Mountain ore in 1850 gave impetus to the city's industrial growth. In 1856 about 100,000 tons of pig iron was produced and 30 iron works were operating, their output being valued at $5,000,000.

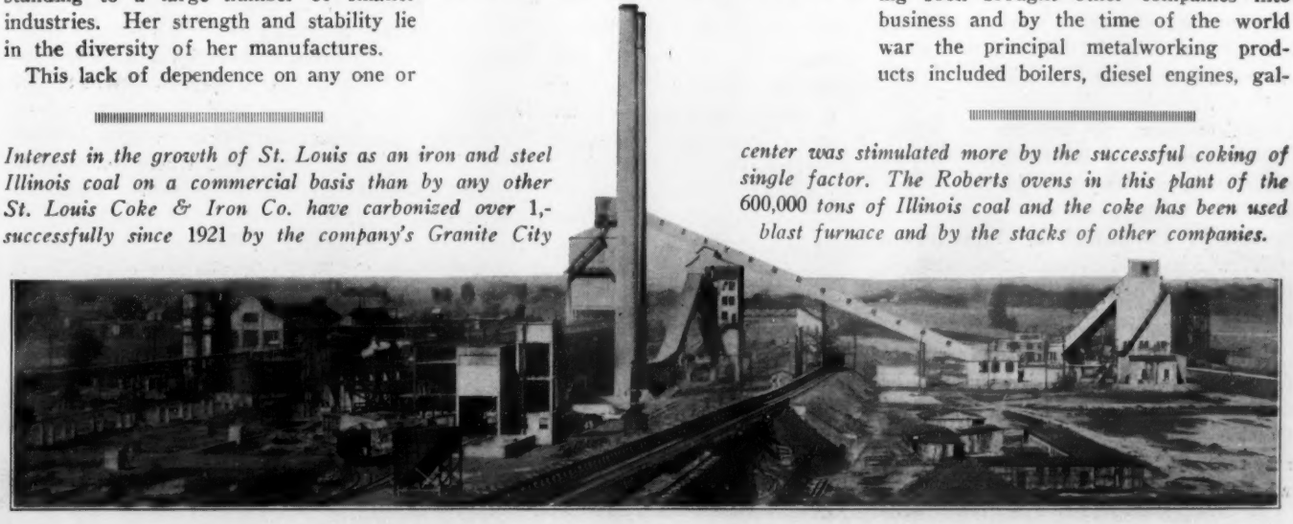
Among these early plants were a rolling mill built in 1851 in North St. Louis; a machine shop established in 1840 by D. R. Garrison and his brother; the Empire Stove Works founded in 1842 by Hudson E. Bridge and his brother; the Excelsior Stove Works; Hitchcock & Co., maker of stoves and plows; Palm & Robinson, builders of locomotives; and many others. The manufacturers associated with these and other companies, and Pierre Chouteau, James Harrison and Felix Valle who were identified with the early development of Iron Mountain, laid the basis for the later growth of the metalworking industries. Another pioneer was William F. Niedringhaus, who first introduced enameling on sheet iron in this country and blazed the trail for the great enameling industry of St. Louis. James Green founded the Laclede Fire Brick Mfg. Co. in 1844 and in 1857 the Christy Fire Clay Co. was formed.

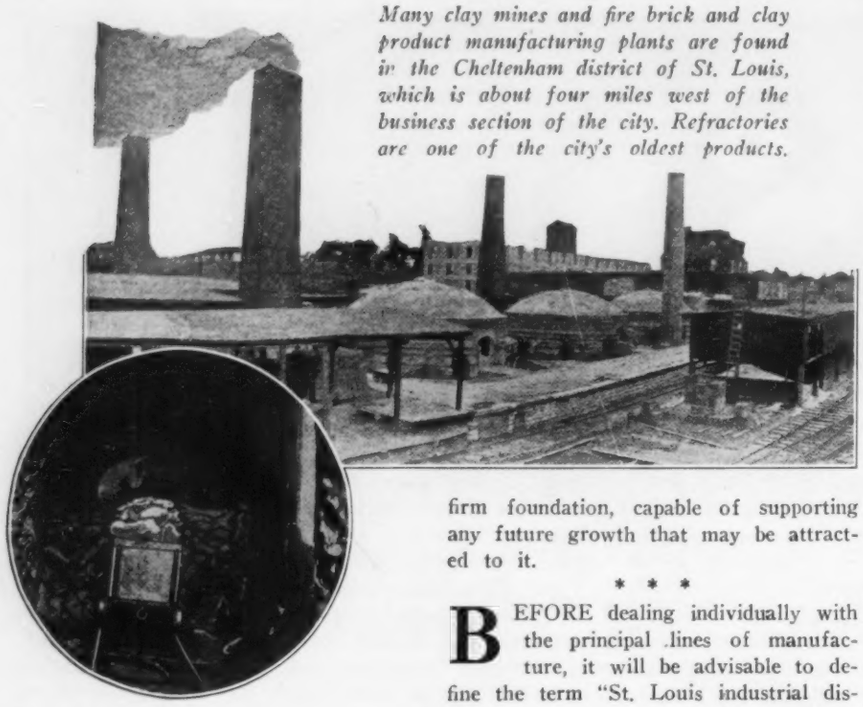
Early Industries Thrived

While the foregoing is only a small part of the history of the pioneer industries, it serves to indicate the diversity of manufacturing enjoyed by St. Louis from the beginning. While the production of iron and steel experienced a checkered career owing to the early uncertainty of raw material supplies, all of the industries engaged in the secondary operations have grown steadily. From modest beginnings the stove, enameled ware, clay products and steel foundry industries have developed to a point which gives St. Louis first or second rank among American cities in these products.

The natural expansion of manufacturing soon brought other companies into business and by the time of the world war the principal metalworking products included boilers, diesel engines, gal-

Interest in the growth of St. Louis as an iron and steel center was stimulated more by the successful coking of Illinois coal on a commercial basis than by any single factor. The Roberts ovens in this plant of the St. Louis Coke & Iron Co. have carbonized over 1,600,000 tons of Illinois coal and the coke has been used successfully since 1921 by the company's Granite City blast furnace and by the stacks of other companies.





Many clay mines and fire brick and clay product manufacturing plants are found in the Cheltenham district of St. Louis, which is about four miles west of the business section of the city. Refractories are one of the city's oldest products.

vanized, enameled and tinned stamped ware; electric motors and accessories; hardware; sugar mill and miscellaneous machinery; iron, steel and nonferrous castings; rolled steel; electric and railroad cars and parts; stoves; wire rope and wire products; lead and zinc products; and pig iron. In addition St. Louis now is one of the leading centers in the production of clay products, including refractories.

Growth Has Been Gradual

It is significant that throughout this century of industrial development, the rate of expansion never approached the proportions of a boom. The growth was gradual and substantial, with comparatively little stock manipulation or artificial impetus. Moreover, the control of most of the companies was vested in the members of old St. Louis families. Business was conducted conservatively, and yet in the case of the majority of the manufacturers there was no apparent lack of enterprise in developing markets or in initiating new ideas in the design and construction of equipment. This is evident from the manner in which the stovemakers of St. Louis anticipated changes in the styles of stoves and ranges in advance of their competitors. It also is emphasized by the courage with which steel foundrymen stepped from the beaten path of tradition to develop cast steel railway specialties.

The conservatism of the early manufacturers was confined largely to the financial administration of their businesses. Outside capital was used sparingly. The result is that now the modern framework of St. Louis industry rests on a firm foundation, capable of supporting any future growth that may be attracted to it.

* * *

BEFORE dealing individually with the principal lines of manufacture, it will be advisable to define the term "St. Louis industrial district. For the purpose of comparing census reports in the table on page 20, St. Louis city and St. Louis county, Mo., and Madison and St. Clair counties, Ill., were included. These units were utilized because statistics for them are available.

A better method of outlining the district for the purpose of analysis is to include the outlying sections which are served by the unified transportation facilities of St. Louis. With the exception of one or two small sections in Illinois that are represented in a single important industry, all of the manufacturing area contingent to St. Louis falls within the limits imposed by this definition.

The district then would include all plants within the city limits, regardless of whether or not they are on the lines of the terminal railroad association; a strip of the eastern part of St. Louis county; East St. Louis, Brooklyn, Cahokia, East Carondelet and Prairie Du-Pont and some contingent territory in St. Clair county, Ill.; and Venice, Madison, Newport and Granite City and their environs in Madison county, Ill.

If any one branch of metalworking in the district can be said to be more important than another, it probably is the foundry industry. According to the figures to be published in *Penton's Foundry List* for 1924, now in the process of printing, St. Louis city is credited with 69 foundries, giving it rank as the ninth city of the United States in number of foundries. If the casting plants in the area defined in the preceding paragraph are included, the total becomes 78 and the district would rank seventh. By adding the plants in St. Charles, Belleville, Edwardsville, O'Fallon and Alton the total amounts to 101. This sharp increase is accounted for by the 15 plants in Belleville, in which the stove industry is well entrenched.

The most important branch of the casting industry in greater St. Louis is the manufacture of open-hearth steel castings. About 350,000 tons are produced annually, the greater part being in the form of castings for steel railroad cars and locomotives. Tender frames, bolsters, truck side frames, locomotive frames, freight and passenger car frames, driving wheels, etc., account for a heavy tonnage annually. The remainder goes into machinery and miscellaneous products and includes sugar mill and mining equipment, engine details, street cars, etc.

Steel Castings Save Lives

The development of the railway specialty business provides one of the most interesting stories of industry. If it were told adequately it would include scores of incidents of how foundrymen co-operating with the railroads sought constantly to make larger and more intricate castings in order to reduce breakage and eliminate the numerous parts in built-up car members. The side frame of a single piece replaced the old arch bar frame having 249 parts. Better body bolsters were developed from time to time and larger and stronger castings for steel passenger cars were designed and cast until today the construction of a modern passenger car is one of the greatest factors contributing to the safety of the traveling public. In all of these achievements, St. Louis steel foundrymen have taken the leadership. St. Louis steel castings are exported to railroads in England, France, Italy, Belgium, Spain and other countries.

Closely related to metalworking operations is the refractories industry, in which St. Louis holds an important place.

Most of the companies make sewer pipe and other clay products in addition to fire clay refractories, which are used principally in the steel and glass industries. In recent years, St. Louis manufacturers have been devoting more attention than heretofore to products for use in iron and steel making. At least one company has been successful in competing in eastern markets on certain specialties such as runner brick and nozzles.

Because H. E. Bridge, Giles F. Filley and C. H. Buck, pioneers of the stove business in St. Louis, could foresee the possibilities of the city as a distributing center and because their successors have kept pace with the changing requirements of the buying public, the city and some of its suburbs stand as the leading stove manufacturing center of the country.

One of the newer industries which re-

cently has gained importance is the manufacture of automobiles and accessories. It is estimated that in 1923 cars and parts valued at $49,000,000 were made. Four automobile plants are operated, the latest of importance being the St. Louis assembly plant of the Chevrolet Motor Co., which is situated in a new industrial section on the belt line in the northwest part of the city.

The electrical industry has made rapid strides in St. Louis. It is estimated that the output of motors, transmission cable, switch boards, fuses, transformers and electrical supplies in 1923 amounted to $50,000,000. Motors of a wide range in horsepower are made although the majority are of the smaller sizes.

St. Louis manufacturers were among the first to develop the diesel engine in America. Two well known and firmly established companies have been engaged in building diesel engines for a number of years and their products are favorably known not only in the United States but in many foreign countries. One builder alone exports to 29 countries. The diesel engines made in St. Louis are used for marine and industrial purposes. The stationary diesels are used primarily for driving pumps for pipe lines, drainage districts, and for water works and mines. Most of the export business of one of the companies consists of diesel engines for sugar mills. The company also manufactures sugar mill machinery.

Inasmuch as much of this material is shipped to Cuba, it is interesting to note that on frequent occasions it is possible to load heavy machinery on new St. Louis-made freight cars which are destined for delivery to Cuban railroads.

St. Louis also is an important boiler manufacturing city. One of the companies building boilers in the city ranks about second in size among the boiler manufacturers of the country. St. Louis as a city easily ranks second in the manufacture of boilers.

One interesting feature in connection with boilermaking is that the only plate mills capable of rolling the larger size plates for boiler work are situated in eastern Pennsylvania, while the boiler manufacturers who use plates of this size all are situated near or west of Youngstown, O. One of the St. Louis companies frequently has found it expedient to make drums of two pieces because railroad tunnels prevented or made difficult the shipment of plates.

Wire rope and wire products hold an important position in the list of St. Louis metal products. The two companies engaging in the wire rope business have become well established by virtue of the quality of their product. One of these companies originated the colored strand now widely used to identify different grades and qualities of wire rope. Due to the fact that the rope is sold on a quality basis, it is possible for St. Louis makers to ship to practically all markets.

St. Louis ranks next to one other city in the manufacture of wire rope. It is estimated that its production represents about 20 per cent of the wire rope output of the country.

A great many other industries have assumed important positions in St. Louis. For instance the manufacture of railway and street cars and railway supplies has assumed impressive proportions and the production of iron and steel and their products is expanding rapidly.

Making stampings and enameled ware has become one of the Granite City's greatest industries and is the basis for the growth of the National Enameling & Stamping Co. in steelmaking and finishing operations. The inset shows the first hand press used by William F. Niedringhaus, founder of the company and with his brother Fred G., builder of Granite City.

Things That Have Won St. Louis Prestige in Steel

Accomplishment

Twenty-four years ago the Scullin Steel Company engaged in the manufacture of steel railway freight car specialties with a small plant.

Today it operates the largest steel foundry in the world.

Scullin truck bolsters and side frames are standard equipment for all leading American railroads.

They have carried the banner of American ingenuity and prestige throughout the two hemispheres wherever modern transportation has marked the path of civilization.

The World's Largest Steel Foundry—
Combined annual plant capacity 200,000 tons

Scullin Steel Company

St. Louis, Missouri

Builders of Industry

Things That Are Making St. Louis A Greater Steel Center

Progress

In 1920 the Scullin Steel Company entered the rolled steel business.

It gave St. Louis one of the most modern plants in the United States for the manufacture of structural shapes, merchant bars and related products.

It created the first standard structural shape mill in the Southwest.

The same management and organization that won for the company its eminence in the steel casting field is directing its development as a manufacturer of finished rolled steel.

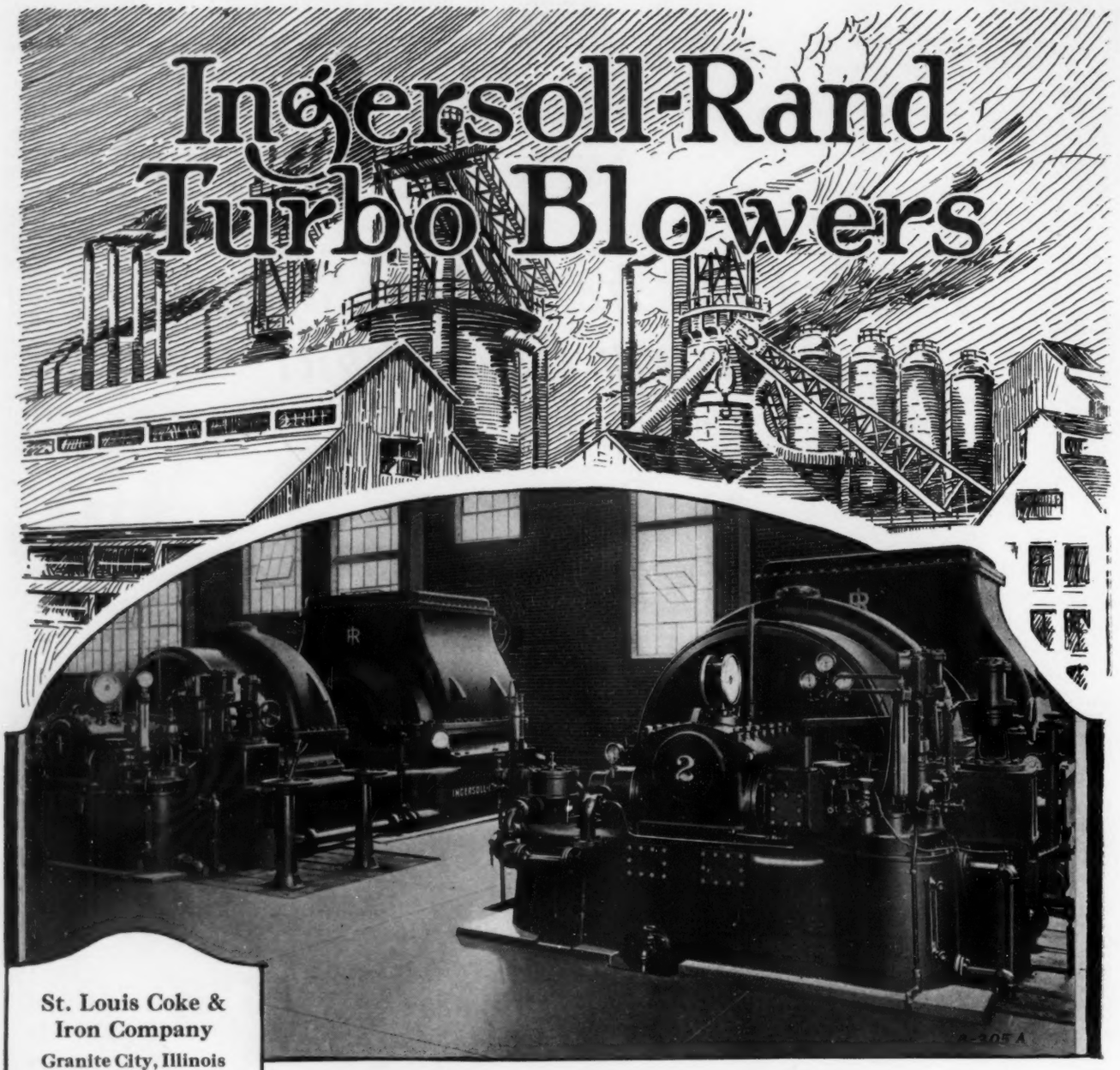
The Southwest's Largest Merchant Steel Mill
Combined annual plant capacity 200,000 tons

Scullin Steel Company

St. Louis, Missouri

Builders of Industry

Ingersoll-Rand Turbo Blowers



St. Louis Coke & Iron Company
Granite City, Illinois

These Turbo Blowers have been in operation since the Furnace was blown in, during 1921.

Each will deliver 45,000 cubic feet per minute against 15 pounds.

Each will deliver blast against a maximum pressure of 25 pounds. They are served by an I-R Barometric Condensing Plant.

IR TURBO BLOWERS for low and medium discharge pressures are available for pressures of one to 30 pounds per square inch in sizes ranging from 3,000 to 80,000 cubic feet of free air per minute.

INGERSOLL-RAND TURBO COMPRESSORS are available for compressing air to a discharge pressure of 90 to 110 pounds per square inch gauge in sizes ranging from 5000 to 10,000 cubic feet of free air per minute.

INGERSOLL-RAND COMPANY—11 BROADWAY, NEW YORK CITY.
Offices in principal cities the world over.
FOR CANADA, REFER-CANADIAN INGERSOLL-RAND CO., LIMITED. 260 ST. JAMES ST., MONTREAL, QUEBEC.

Ingersoll-Rand

The Story of the Industrial Development of St. Louis is the Story of Coke and Iron

IT is a drama of vision, courage and achievement.

—VISION to see the dormant opportunities in the mineral resources lying almost at the city's door;

—COURAGE to overcome obstacles in order to utilize these resources and

—ACHIEVEMENT, which by proving that the "impossible" can be done, that local coal and ore can be used successfully to make pig iron and that raw materials can be assembled more cheaply here than in any other important industrial center, has laid a firm foundation for the future industrial growth of ST. LOUIS.

We are proud to present in the following pages evidence of the conspicuous part we have played in this development.

St. Louis Coke & Iron Co.

Chicago
208 So. La Salle St.

St. Louis
Planter's Building

Where Coke Leads, Industry Follows

THROUGH all the ages with but few exceptions, the metallurgical union of ore and coke has been effected near the source of fuel. The ore seeks the coke.

IN successfully carbonizing more than 1,600,000 tons of Illinois coal obtained less than 100 miles from the ovens, from which more than 1,000,000 tons of metallurgical coke have been produced, this company has given to St. Louis its most important claim to extraordinary possibilities for future industrial development.

In making 500,000 tons of pig iron, the average consumption of Illinois coke was 1951 pounds per ton of iron made—a performance from 10 to 15 per cent better than standard practice.

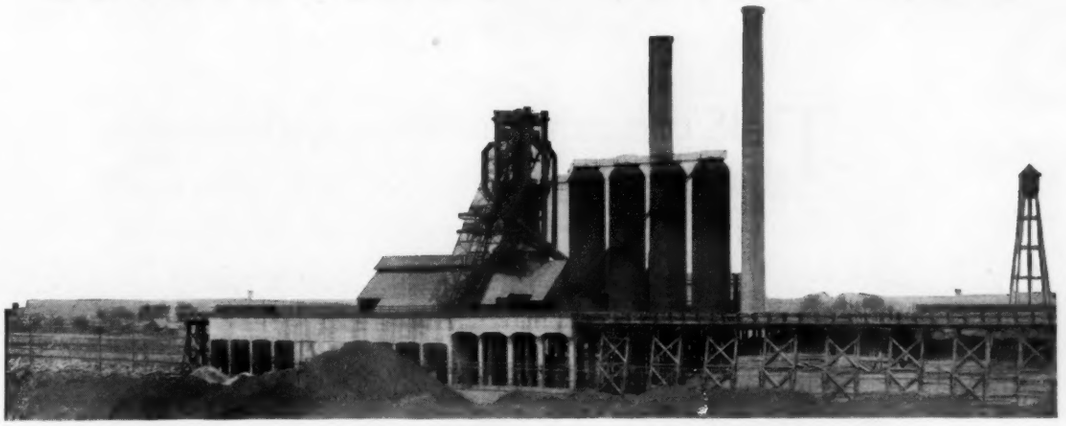
Blast furnace operators who have used our coke are its best advertisers.

St. Louis Coke & Iron Co.

Chicago
208 So. La Salle St.

St. Louis
Planter's Building

Pig Iron Is the Bread of Industry



MANUFACTURING requires pig iron. Until recently St. Louis was the only large iron consuming point in the country not having substantial local producing capacity. The advantages of Illinois coke, of high-grade Missouri ore and of local limerock culminate in this company's Granite City blast furnace, which since February 8, 1921, has given St. Louis important rank in pig iron production.

TO INDUSTRIES attracted to the St. Louis district, our facilities guarantee a dependable supply of steelmaking and foundry grades of pig iron.

Present Daily Capacity:

Coke . . . 1500 tons *Gas . 10,000,000 cu. ft.*
Pig Iron . 500 tons *Tar . . 16,000 gallons*
Ammonium sulphate . 50,000 pounds

St. Louis Coke & Iron Co.

Chicago
208 So. La Salle St.

St. Louis
Planter's Building

For Three Generations

THIS company, for three generations, has taken an important place in the industrial leadership of St. Louis.

1—From the first stages, it has been actively identified with the epoch making achievement of coking Illinois coal.

2—It built the first sheet and tin plate mills in St. Louis and the Southwest.

3—It developed the largest business engaged in the manufacture of enameled ware.

4—It operates the only plate mill in the Southwest.

5—The scope of its operations *"From Ore to Store"*, is the fruition of an idea conceived 40 years ago and carried forward step by step to final accomplishment.

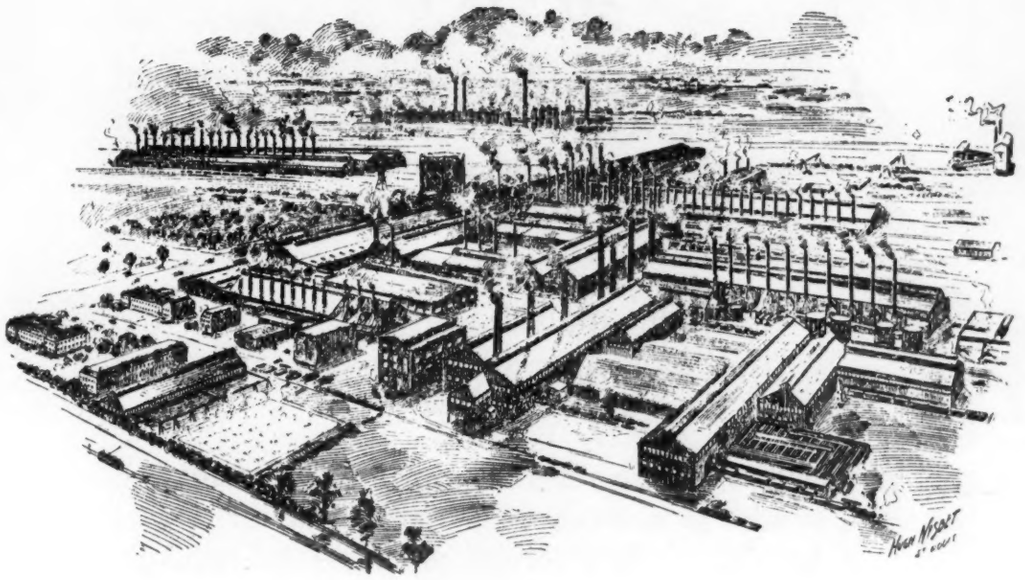
National Enameling & Stamping Co.

General Sales Office: Granite City, Ill.

Works:

Granite City, Ill. St. Louis, Mo.

"From Ore to Store"



WITH an Annual Capacity of 450,000 tons of Basic Open Hearth Products we are at all times prepared to serve users of steel with any thing they may require in

Ingots; Billets; Sheet Bars; Sheared Plates; Universal Plates; Galvanized Sheets; Black Sheets; Blue Annealed Sheets; Tin Plate.

We operate a 100-inch Plate Mill; 16-Sheet Mills; 20-Tin Mills; a 72-inch Jobbing Mill.

National Enameling & Stamping Co.

General Sales Office: Granite City, Ill.

Works:

Granite City, Ill. St. Louis, Mo.

Laclede

A name that since 1764 has claimed high and honorable veneration in American history in connection with the founding of St. Louis and the development of Southwestern territory.

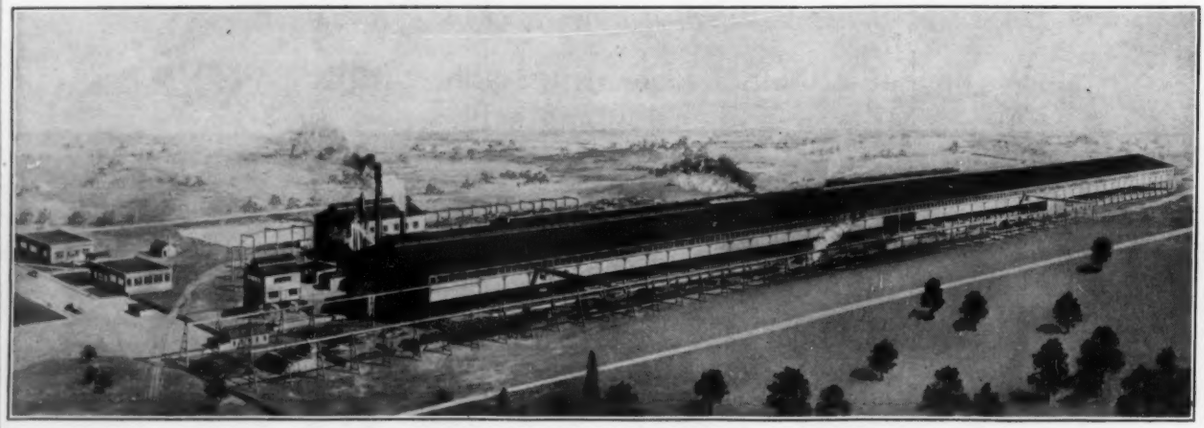
A name, which, applied to industry today has carried forward a heritage of enterprise and vigor from the rugged past.

A name, which, given to the products of mill and works is a symbol of quality and of service backed up by a record of successful management.

Laclede Steel Co.

General Offices: Arcade Building, St. Louis, Mo.

Plants: East St. Louis, Ill. Madison, Ill. Alton, Ill.



Madison Plant—Madison, Illinois

MODERN completely equipped Open Hearth Furnaces, Blooming and Billet Mills, Finishing Mills, Cold Rolling Mills and Auxiliary Departments enable us to assure prompt and accurate service to all of our customers.

We specialize in—

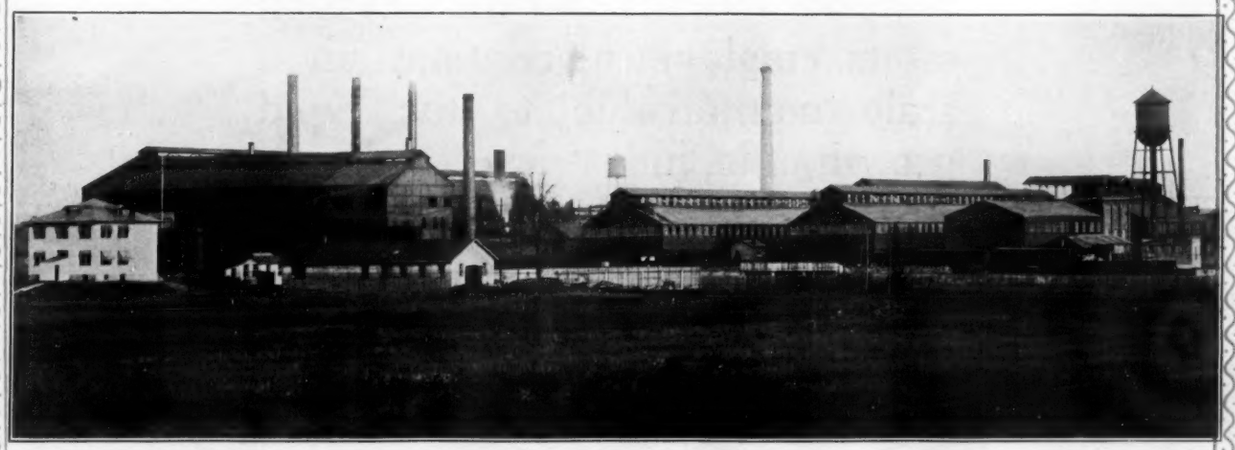
Strip Steel—Hot or Cold Rolled
Hoops, Bands and Bars
Axles—Plain Normalized or Quenched and Tempered
Crank Pinks, Piston Rods, Shafts, etc.

Rounds and Squares—for concrete reinforcement, Angles, Channels and Flats rolled from Open Hearth Steel Billets or Steel Rails.

Laclede Steel Co.

General Offices: Arcade Building, St. Louis, Mo.

Plants: East St. Louis, Ill. Madison, Ill. Alton, Ill.



Alton Plant—Alton, Illinois

The Commonwealth Idea

Is one of St. Louis' most cherished institutions.

Based on the practical application of the *Golden Rule*, it breathes inspiration to the 3200 loyal members of the Commonwealth family. Recognizing the efficacy of human engineering, it elevates the quality of workmanship and manifests its deeds in the higher standard of the products of labor.

Its sphere of influence constantly is broadening, giving to St. Louis a powerful incentive for the elevation of its employment relations on a scale comparable to the rapid growth of its industries.

The Commonwealth Steel Co.

Plant at
Granite City, Ill.

General Offices:
Pierce Building
St. Louis

The Commonwealth Aims

1. Simplicity and strength of construction.
2. Excellence of design, material and workmanship.
3. Elimination of repairs and cost of maintenance.
4. Protection of life and property.
5. Right relations and working conditions in the plant.

They are sought through fellowship and service—Fellowship which treats men as men and recognizes their power to think—Service founded on the knowledge that Commonwealth products—cast steel frames and details for locomotives and cars—daily serve humanity in lowering the cost of railway maintenance and protecting of the life and property of the millions of patrons of the railroads of the world.

We are proud of Commonwealth's material accomplishments; but we are prouder of the Commonwealth Idea.

The Commonwealth Steel Co.

Plant at
Granite City, Ill.

General Offices:
Pierce Building
St. Louis

1852 1924

Seventy-Two Years of Service

IN serving the industries of St. Louis and Southwestern territory with iron, steel, shop supplies and equipment, our distributing facilities have kept closely in step with the industrial growth, and we are prepared to meet all future needs.

Our History:

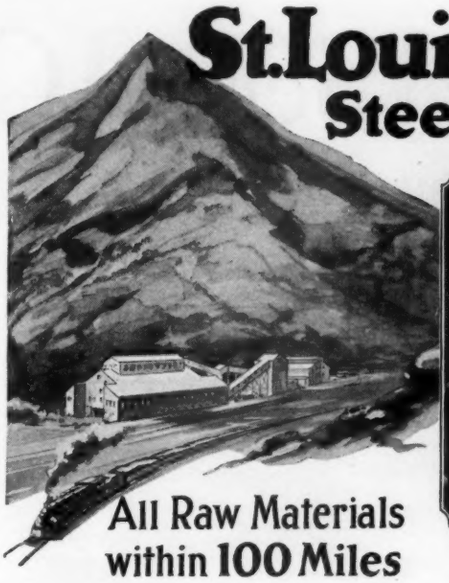
1852—Founded by George Beck and James A. Corbitt
1877—Firm name changed to Beck & Corbitt Iron Co.
1924—Incorporated as Beck & Corbitt Company

Complete Warehouse Service
in
Rolled Iron and Steel
Spikes : Bolts : Nuts : Washers
Boiler Makers Supplies
Machine Shop Supplies
Machine Shop Equipment

Beck & Corbitt Company

St. Louis, Missouri

St. Louis, the New Steel Center



All Raw Materials within 100 Miles

THE first pig iron made entirely from materials produced within 100 miles of St. Louis was turned out in quantity on July 21, 1923. Converted into steel ingots and plates, this St. Louis product is now being used by plants in the St. Louis industrial district at an enormous saving in transportation over Northern ores.

Ore from Iron Mountain, metallurgical coke from Illinois coal, Missouri limestone, are used in making this 100% product of the St. Louis district. Iron Mountain has "come back" and is making St. Louis the nation's newest great steel center.

Hidden Riches Revealed

Millions of tons of ore lay hidden in Iron Mountain since mining was abandoned there years ago. Pioneer iron men who transported ore with ox teams over plank roads to the Mississippi River thought the ore vein had run out. Recent excavations have uncovered the secret of this mountain of 60% metallic iron.

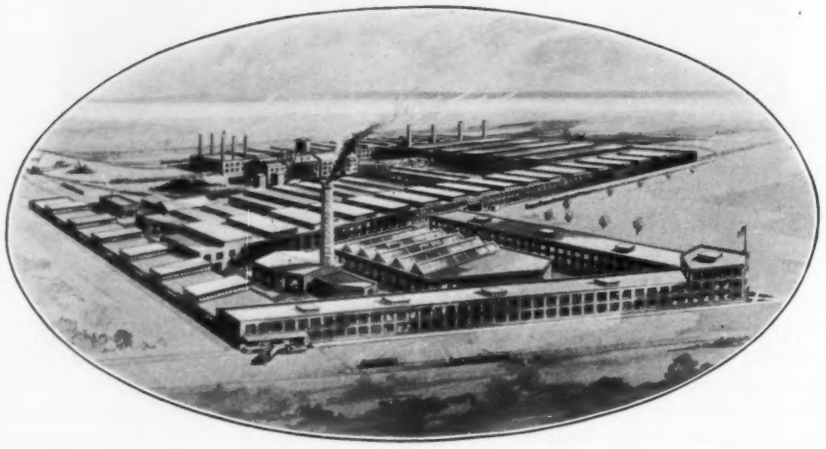
St. Louis recently solved the coke problem by carbonizing Illinois coal with the marvelous Roberts' oven. Revealing the hidden riches of Iron Mountain was the last link in the economical manufacture of steel from materials wholly within the St. Louis district. It is worth your while to investigate conditions in St. Louis.

Send for one or both of these illustrated booklets, "Industrial St. Louis" or "St. Louis — The Home City."

ST. LOUIS CHAMBER of COMMERCE
St. Louis, U.S.A.

St. Louis Screw Co.

St. Louis, Missouri



Makers of

BAR IRON
BOLTS
NUTS
SCREW MACHINE PRODUCTS

We Do

GALVANIZING

VISION

has helped make St. Louis

IT WAS vision—the power to foresee great future possibilities where other men saw only difficulties and discouragements—that laid the foundation for the steel and iron industry in St. Louis.

It was that same quality of vision—the ability to foresee the coming needs of the electric light and power industry of a whole continent, and the patience to work steadily toward supplying those needs—that has given St. Louis a leading position in the history of the development of commercial electricity.

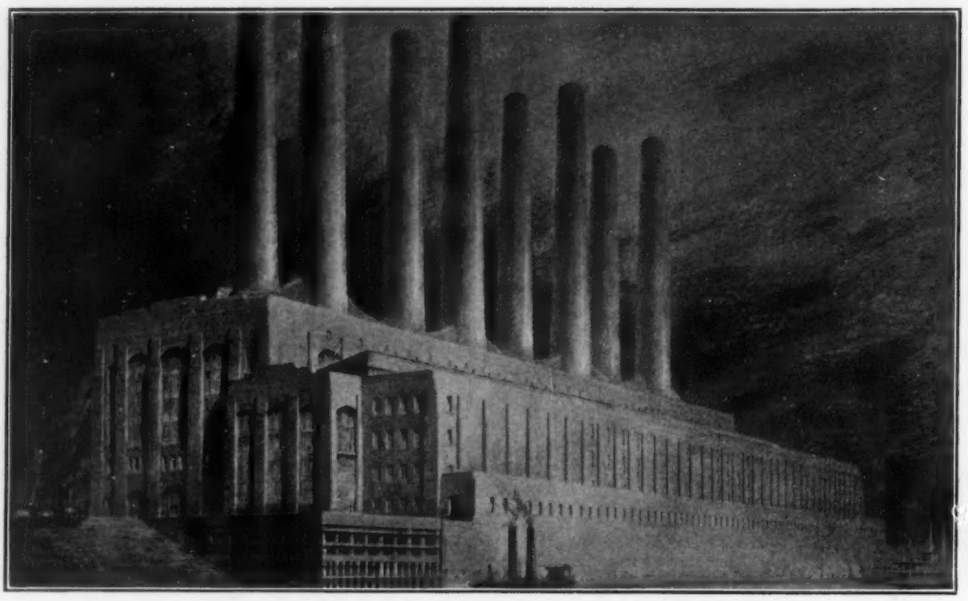
We are proud of the fact that for over thirty years Wagner Quality has been a name conspicuously identified with everything most progressive in electrical manufacture, and has contributed its share to make our city known to electrical engineers throughout the world.

St. Louis, through the Wagner laboratories, gave to the world the first commercially successful single-phase alternating-current motor; the first silicon steel transformer; the first directed-draft air-cooled motor; and the first practical alternating-current motor that also acts as a power-factor corrective—

THE FYNN-WEICHSEL MOTOR.

WAGNER ELECTRIC CORPORATION

6400 Plymouth Ave. St. Louis, Mo., U.S.A.



CAHOKIA—LOPULCO
A Monument to St. Louis Vision and Courage

THE industrial growth and activity of any community is but the mirror of the courage and vision of her industrial leaders. St. Louis' utilities have for a long time been conducted by men endowed with vision and courage, so that St. Louis has the lowest power rates of any of the fifteen largest cities in the United States.

Cahokia is a monument to efficient power production that will not only put St. Louis further forward from an economical standpoint, but make "reliability of service" a by-word.

St. Louis is now taking advantage of an opportunity to become a gigantic iron and steel manufacturing center. What the Combustion Engineering Corporation, through its Lopulco Pulverized Fuel System, has accomplished for power the Hermansen Recuperative Furnaces for all metal refining processes will do to make St. Louis the low priced metal manufacturing center of the country.

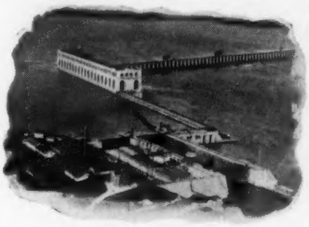
Combustion Engineering Corporation
Combustion Engineering Bldg.—43 Broad Street New York City
Offices in Principal Cities Throughout the World

Frederick Multiple Retort Stokers
Type E Stokers
Type D Stokers
Type K Stokers
Type H Stokers

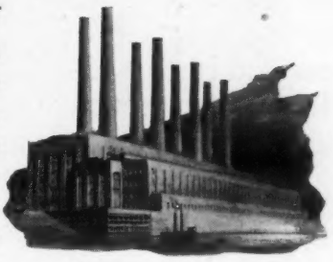
Self-Contained Stokers
Green Chain Grate Stokers
Green Cast Iron Hoppers
Green Pressure Waterbacks
Quinn Fuel Oil Equipment

Lopulco Pulverized Fuel Systems
Coxe Stokers Grieve Grates
Air Heaters
CEC Tube Scraping Device
Combusco Water Seal Conveyors

Cheap Power is Nature's Gift to St. Louis



A recent statement of the United States Bureau of Mines is that within a radius of 75 miles of St. Louis there is enough minable bituminous coal to supply all the requirements of the entire United States for the next 100 years at the present rate of consumption.



At Keokuk is the greatest hydro-electric power development in the middle west.

Union Electric Light and Power Co. utilizes both the vast mines of Illinois and the mighty Mississippi to give cheap dependable power to St. Louis industry. It is erecting Cahokia, a 400,000 horsepower pulverized coal plant within 20 miles of the Illinois coal fields, the first unit of which already has established a record as the most efficient power plant in America. Cahokia generates a kilowatt hour of electricity with less heat units of coal than any other plant in the nation.

Approximately half of the entire output of the Keokuk hydro-electric station comes to St. Louis industry. Keokuk, Cahokia and Ashley street steam station of Union electric are interconnected with a modern system of overhead lines, underground cables and automatic sub-stations making Union Electric power dependable for industry.

St. Louis enjoys the lowest average electric rates among the fifteen largest cities of the United States.

Union Electric Light and Power Company

St. Louis Missouri

THE growth of a city and the growth of the financial institutions that serve it are closely allied. A city develops faster when its financial service stations are functioning—willing and able to encourage and assist industrial growth.

As a city builder we are doing our best. We have financed the construction of many business and institutional buildings. Many concerns have located in St. Louis with our assistance.

Twenty-five years of reliable service have proved the worth of "Mercantile Service", and to the industry considering a St. Louis connection or location we particularly extend our welcome and offer to assist.

Mercantile Trust Company

Member Federal Reserve System — Capital & Surplus Ten Million Dollars

EIGHTH AND LOCUST — SAINT LOUIS — TO ST. CHARLES

Part of the installation at The St. Louis Coke & Iron Company of 8 V-type boilers built by Heine

The needs of an industrial center

To become a great industrial center, as St. Louis is, a city needs many things, but these three most of all—coal and iron and power.

Power—the third of this industrial trinity—is the business of the HEINE BOILER COMPANY. Heine Boilers, for forty-two years, have been making their contributions to St. Louis industry.

It is not enough, however, to supply power. That power must be furnished with efficiency, reliability and economy. It has from its organization been the pride of the Heine Company to build boilers worthy of complete confidence—boilers that have always held, and still hold, the place of leadership among water-tube boilers in all-around steaming qualities.

The St. Louis Coke & Iron Company has deservedly taken a post of leadership in the development of coking processes and the production of high-quality iron. The uniformly high quality of its equipment has contributed to the high quality of its products.

This company's power plant is fitted with eight V-type boilers built by Heine.

Heine Boiler Company

INCORPORATED

5319 Marcus Ave., St. Louis, U.S.A.

Freyn, Brassert & Company

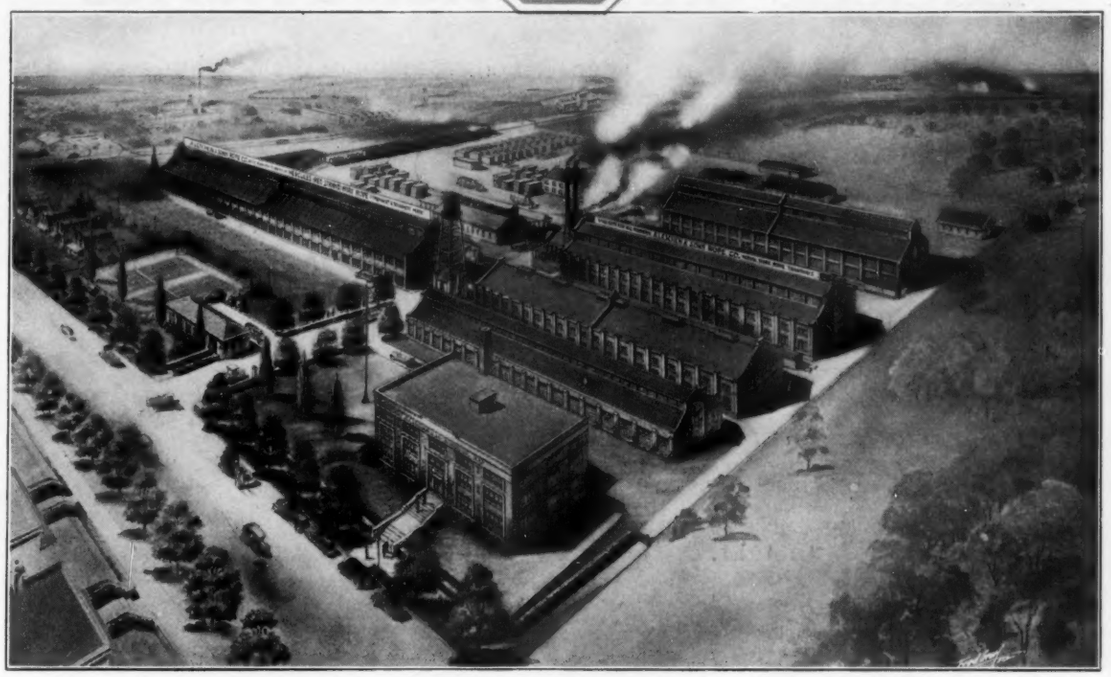
Engineers

Philadelphia CHICAGO London

TENTH ANNIVERSARY

Number of Individual Contracts Received	502
Number of Customers Served	160
Number of Repeat Orders Obtained	85
Number of Contracts Placed by One Single Customer	38
Number of New Blast Furnace Plants Constructed	14
Number of Old Blast Furnace Plants Remodeled	14
Total Pig Iron Tonnage Capacity Built in the United States in 1918-1924	4,800,000 = 100.0%
Total Pig Iron Tonnage Capacity Designed by Largest Steel Interests Themselves	1,675,000 = 35.0%
Total Pig Iron Tonnage Capacity Designed by Freyn, Brassert & Company	2,130,000 = 44.5%
Total Pig Iron Tonnage Capacity Designed by Others	995,000 = 20.5%
Number of Birkholz-Terbeck Gas Burners Installed	1,288
Number of Brassert Gas Washers Installed	101
Number of Dorr Thickener Installations Made	17
Number of Bacon and Freyn-Brassert Waste Heat Boilers Furnished	26
Number of Mathesius Hot Blast Gate Valves Installed	126
Number of Weinel Chimney Valves Installed	51
Number of Brassert-Jones Stove Linings Installed	96
Number of Electric Sheet Roll Heaters Furnished	26
Number of Reports, Appraisals, Investigations, etc., Made	71
Office Floor Space Occupied in 1914	308 sq. ft.
Office Floor Space Occupied in 1924	6,099 sq. ft.

In 1919-1920 FREYN, BRASSERT & COMPANY designed and supervised construction of the Frances Furnace of the ST. LOUIS COKE & IRON COMPANY



Where Leschen Wire Rope is Made. Modern machines now replace the original method shown below

"HERCULES" [Red Strand] WIRE ROPE

Made in St. Louis—Used the World Over

When the manufacture of Leschen Wire Rope was begun, the wire rope industry was in its infancy.

As a result, Leschen Wire Rope has "grown up" with the various wire rope using equipment now in service.

As new conditions and new machinery have been developed, we have developed a rope to meet them.

The Method Used in Making the First Leschen Wire Rope

For all heavy work, such as on cranes, cableways, derricks, dredges, excavators, hoists, steam shovels, etc., we recommend Hercules (Red Strand) Wire Rope, which is a grade of rope that has proven its exceptional ability by its long service record.

Tell us how you use wire rope and we shall be glad to suggest the kind that will give you the best results.

Established 1857

A. Leschen & Sons Rope Company

5909 Kennerly Avenue, St. Louis

New York Chicago Denver San Francisco

St. Louis is the Home of Famous Laclede-Christy Refractories

BACK in 1844, the year Laclede-Christy was founded, the population of St. Louis was but 34,000. Today there are a million people in the great metropolis and its suburbs.

As St. Louis has grown and progressed, so has Laclede-Christy. We are especially proud of the success we have had in producing Fire Clay Refractories for the Iron and Steel Industry.

Today, many of the best known steel plants in the country are using them, and report *maximum tonnage*, as well as *minimum cost of refractories per ton of metal produced!*

Whatever *your* requirements—in Fire Brick, Bung Brick, Furnace Linings, Sleeves, Nozzles, Runner Brick, etc.—write us today so that we may quote you prices on our dependable products.

LACLEDE-CHRISTY ST. LOUIS, U. S. A.

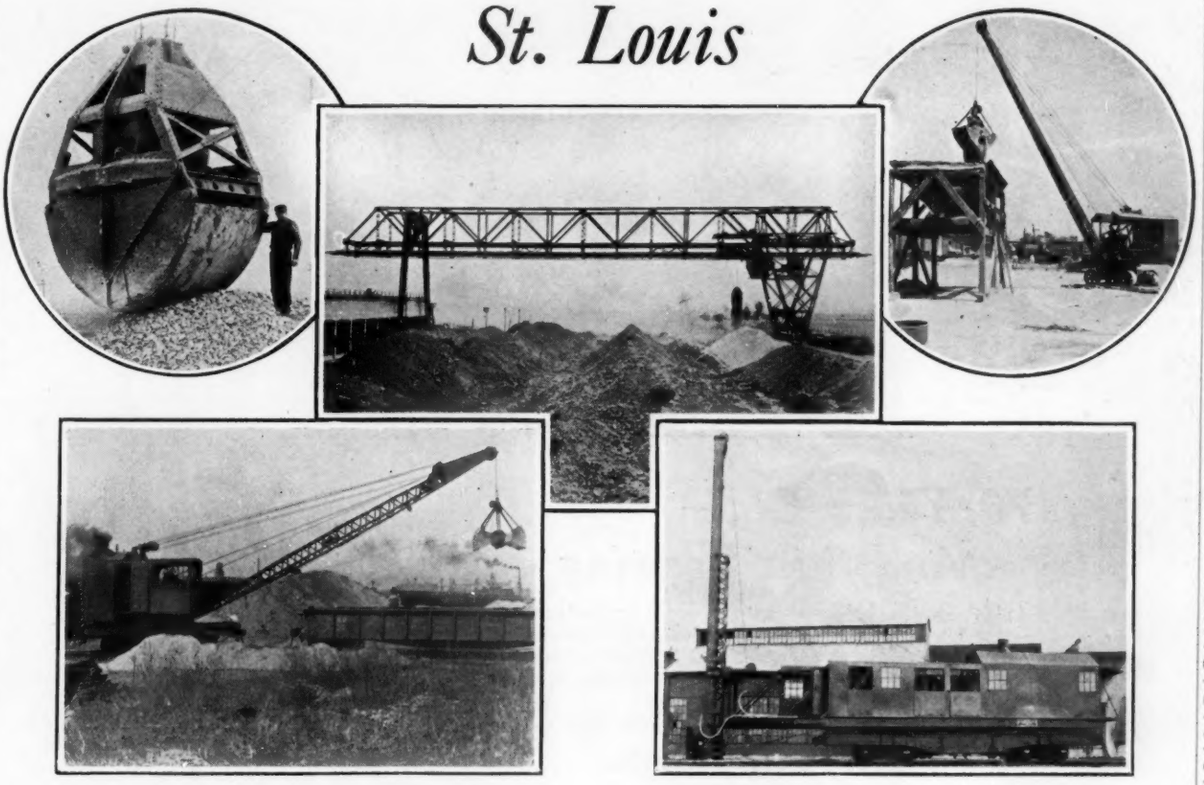
Ask for our Educational Film, "The Story of Fire Clay Refractories"

Suprafrax
The Super-Refractory
Laclede-Christy Originators and Sole Manufacturers

Let us demonstrate the advantages of L-C Suspended Flat Arches.

HR 548

McMyler-Interstate Equipment in St. Louis



Industrial Leaders in St. Louis using McMyler-Interstate Products

St. Louis Coke & Iron Co.
American Steel Foundries
Wabash Railroad Co.
St. Louis Southwestern R. R. Co.
Hunkins-Willis Lime & Cement Co.
Missouri Portland Cement Co.
H. H. Hall Construction Co.
Moore Bros. Construction Co.
Columbia Quarry Co.
Missouri-Kansas-Texas R. R. Co.
Aluminum Ore Co.
Missouri-Pacific R. R. Co.
La Clede Gas Light Co.

M. G. Hennessey Machinery Co.

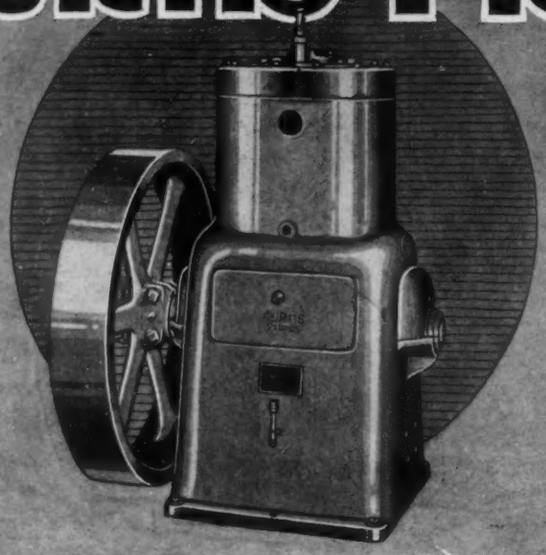
1115 Boatman's Bank Bldg. St. Louis, Mo.

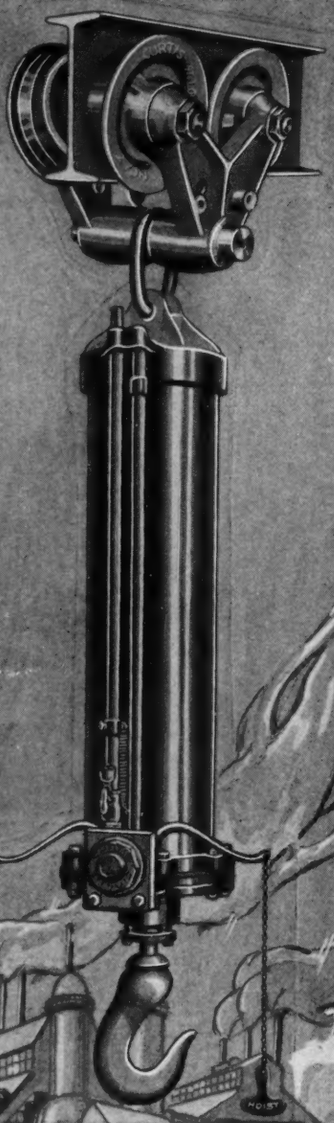
Representatives of

THE McMYLER-INTERSTATE COMPANY, CLEVELAND, OHIO

Locomotive Cranes
Coal and Ore Bridges
Gas and Steam Shovels
Pile Drivers
Clam-shell Buckets
Shipbuilding Cranes
Railroad Equipment
Terminal Cranes
Car Dumpers
Structural Steel
Steel Forgings
Orange-peel Buckets

CURTIS PRODUCTS





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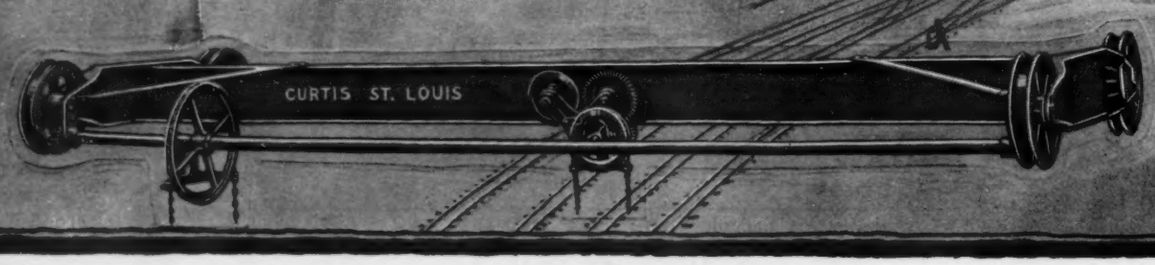
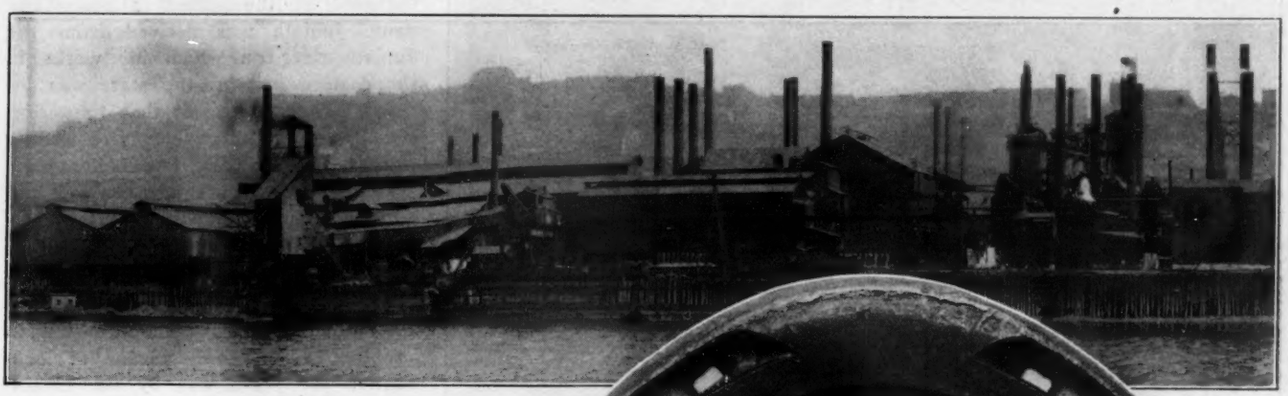


Oldest, Most Compact Plant in the Heart of Pittsburgh Makes Horseshoes



Juniata Shoenberger Works, 100 Years Old

BY A. J. HAIN

THIS year is the one-hundredth anniversary of the founding of the Shoenberger works of the American Steel & Wire Co. in Pittsburgh. The plant was the first to have been established west of the Allegheny mountains for the manufacture of finished iron products. It is the oldest unit among all of the subsidiaries of the United States Steel Corp. Much of its equipment is modern, and in curious contrast there is some that was installed generations ago, still operating efficiently.

The only finished products of the Shoenberger works today are horseshoes, for which the name has been famous since the Civil war. Thousands of kegs of horseshoes were supplied to the allies during the World war. The name Shoenberger is identified with the history of ironmaking in Pennsylvania since the Declaration of Independence. The works have been almost continuously active through this period in the nation's history.

The plant at Pittsburgh was established in 1824 for the manufacture of bar iron, sheet iron, boiler plate and cut nails. These lines have been discontinued, although as recent as the World war steel plates were rolled, and the plant had an annual capacity for 72,000 tons of sheared plate. The plate mill now is partially dismantled.

In an age of motor cars, tractors and airplanes, horseshoes still are being manufactured in as large quantities as ever. The present works has annual capacity for 22,500 tons of shoes and 1500 tons of toe calks. There are 372 styles and sizes of horseshoes, reflecting many peculiarities in requirements in various localities in this country and abroad. They are shipped to all parts of the globe.

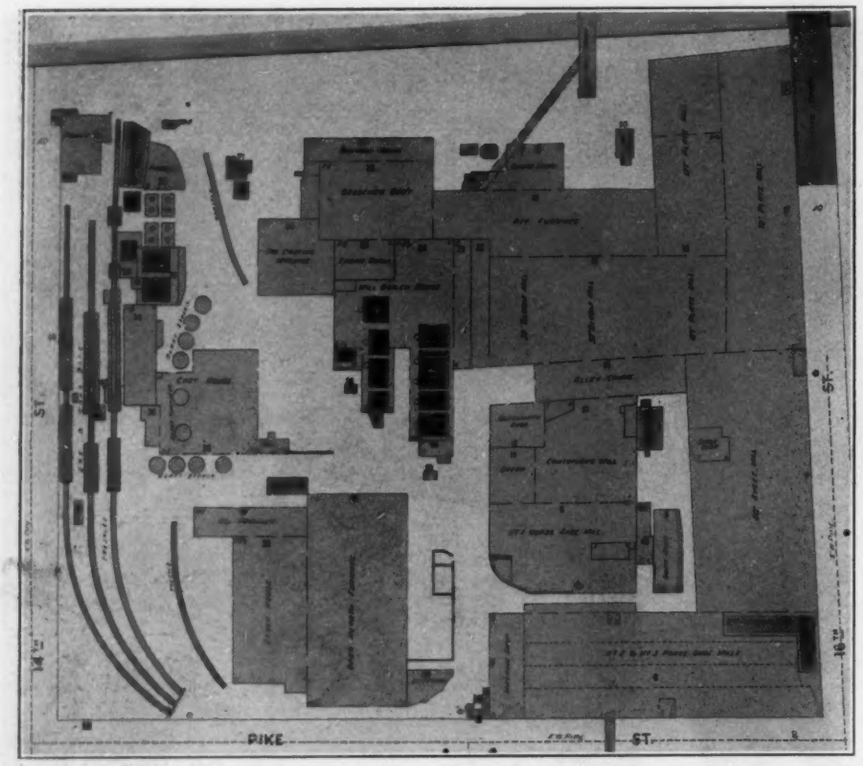
Much has been written in recent years concerning the modern works that are self-contained, manufacturing from "ore to finished product." The Shoenberger works has been doing this for nearly 60 years. Within four city squares, almost in the heart of Pittsburgh, it has iron ore piles, two blast furnaces, two bessemer converters, three basic open-hearth furnaces, rolling mills, finishing equipment and other departments. It not only supplies its own finishing departments with their steel requirements, but has had a surplus to ship to the other plants of its owners.

It is the most compact among all the plants in the Steel corporation's various groups. The 12 acres which it occupies once were referred to by the late B. F. Jones Sr., former president of Jones & Laughlin Steel Co., as "the busiest spot in the American steel industry."

Practically all of the ground area is utilized, and ingenious use has been made of some of the space overhead. Except for one or two departments that have been forced to find shelter in buildings across the street, the works are contained in the area between Fourteenth and Sixteenth streets, Pike street and the Allegheny river.

The two blast furnaces were built in 1865 and 1866, at a combined cost of $155,000, on the spot occupied by the present furnaces. No. 1 furnace was blown in March 15, 1866, and blown out Aug. 1, 1869, after a campaign of 1234 days. It produced in

The author is editorial representative at Cleveland of IRON TRADE REVIEW.



MANUFACTURING "FROM IRON ORE TO FINISHED PRODUCT" WITHIN THE SPACE OF FOUR CITY SQUARES HAS REQUIRED A COMPACT PLANT LAY-OUT, AS NOTED IN THIS PLAN VIEW

that period 27,852 tons of iron, or 22.57 tons a day. The stacks were rebuilt in 1890. No. 1 now has capacity for 275 tons a day. The original furnace was 38 feet high, with bosh 13 feet, well 5 feet 8 inches and stock line 10 feet 6 inches. The present furnace is 76 feet 6 inches high, with bosh 15 feet, 8 inches, well 11 feet 8 inches, stock line 14 feet.

Furnace No. 2 went in Oct. 8, 1866, and was blown out May 26, 1867, after 234 days in blast, producing 4761 tons or 20.7 tons per day. The present No. 2 furnace has nearly the same proportions as No. 1, and it has a daily capacity for 225 tons. These furnaces still are hand charged and are the smallest in use by the corporation.

Engine in Commission 60 Years

The two bessemer converters were built in 1886 by the Shoenberger company, and though their rated capacity was 5 tons they now are operating as 7-ton converters. The No. 1 blooming mill was built in 1877, by the Mackintosh-Hemphill Co., and was one of the first of its kind to be used in this country. A still older "relic" in service today is an engine taken from a river steamboat in the sixties, and installed in the works, where it now is driving a 2-high roughing mill.

* * *

THE first Shoenberger, a native of Germany, arrived in America, and located in the eastern part of the state in the vicinity of Huntington county, about 1774. His business was the manufacture of charcoal pig iron and blooms, in which he engaged up to the time of his death. About 1800 his son, known as "Doctor" Peter Shoenberger, succeeded him, and became one of the leading ironmasters of Pennsylvania. He operated a half dozen charcoal furnaces and forges and owned large timber tracts from which he supplied his furnaces.

In 1824, desiring to obtain an outlet for his increasing bloom product, he started the Juniata Iron Works in Pittsburgh, locating in the four squares occupied by the present plant. The name Juniata was derived from the Juniata river on which his works in the eastern part of the state was located. The product at that time consisted of bar iron, sheet iron, boiler iron and cut nails. The boiler plate was of an exceptional quality and commanded a large, lucrative trade.

Shoenberger Works Chronology

IRONWORKS IN EASTERN PENNSYLVANIA:

About 1774—Peter Shoenberger
About 1800—His son, "Doctor" Peter Shoenberger

MILL DEPARTMENT, PITTSBURGH:

1824-1832—"Doctor" Peter Shoenberger.
1852-1854—G. and J. H. Shoenberger.
1854-1863—G. and J. H. Shoenberger & Co.
1863-1868—Shoenberger & Co.
1868-1873—Shoenberger & Co.
1873-1878—Shoenberger & Co.
1878-1883—Shoenberger & Co.
1883-1893—Shoenberger & Co.

BLAST FURNACES, PITTSBURGH:

1865-1868—W. H. Shoenberger & Blair Co.
1868-1873—Shoenberger & Blair Co.
1873-1878—Shoenberger & Blair Co.
1879-1883—Shoenberger & Blair Co.
1883-1893—Shoenberger, Speer & Co.

MILLS AND FURNACES:

Dec. 24, 1894—Shoenberger Steel Co.
March, 1899—Acquired by American Steel & Wire Co.

Shipped by Wagon

Transportation of the blooms across the mountains to Pittsburgh was a problem, as the only means of locomotion for years was by the Conestoga wagons, drawn by six horses or mules.

Considerable improvement was made when on Nov. 10, 1829, there appeared in Pittsburgh by way of the Ohio and Delaware canal, the first canal boat conveying passengers and freight. The bloom product of the eastern works thereafter were brought to Pittsburgh by canal.

In 1832 Peter Shoenberger organized the firm of P. Shoenberger & Sons, taking in his sons, George K., John H. and Edwin F. At this time the business experienced a remarkable growth.

In 1847 the company's production of nails became 2000 kegs per week, which at that time was considered a remarkably large output.

The death of Peter Shoenberger in the early fifties and the retirement of Edwin F. Shoenberger, caused a dissolution of the firm and the formation of that of G. & J. H. Shoenberger in 1852. The next step in the organization was a co-partnership called G. & J. H. Shoenberger & Co., composed of George K. and John H. and William H. Shoenberger, the latter being a son of George K. Shoenberger. This was in 1854, and the partnership continued until Feb. 1, 1863, when there was another reorganization with the establishment of Shoenberger & Co., a limited partnership, authorized capital $200,000, and operating under a lease from George K. and J. H. Shoenberger.

Blast Furnaces Started

In June, 1863, Thomas S. Blair acquired an interest in Shoenberger & Co. through the purchase of an interest from William H. Shoenberger. He was a nephew by marriage of John H. Shoenberger. Up to February, 1865, the company's operation at Pittsburgh was limited to mill departments. There was need for blast furnaces and a separate company was

organized as W. H. Shoenberger & Blair, a limited partnership, with capital of $50,000, which in 1866 was increased to $200,000. The same partners were interested in both companies, and included besides the Shoenbergers and Blair, General Charles L. Fitzhugh and John Z. Speer.

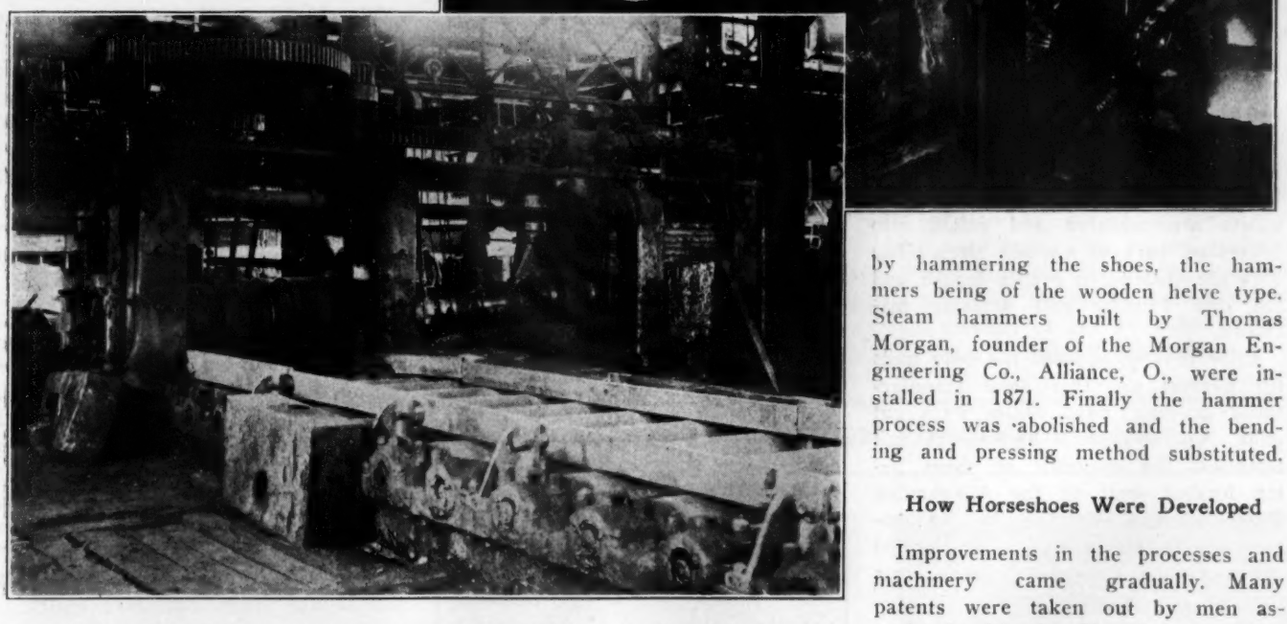
In 1877 William H. Shoenberger sold his interest to Peter Shoenberger, and in 1878 Blair disposed of his interest to the other partners. The name of the furnace company became Shoenberger, Speer & Co. in 1883. Peter Shoenberger died in 1888, John H. in 1890 and George K. in 1892, the three within four years of one another, all active in the affairs of the two companies up to the time of their death.

A reorganization was effected Dec. 24, 1894, combining mill and blast furnace departments under the name of the Shoenberger Steel Co. with a capital of $1,800,000. The incorporators were General Charles L. Fitzhugh, Gottlieb A. Steiner, Henry Fitzhugh, John Z. Speer, J. Ramsey Speer and several of these also in capacities of trustees and executors. The officers were General Fitzhugh, president; John Z. Speer, first vice president; Steiner, second vice president; Edward P. Loy, secretary and John M. Brownson, treasurer. In March, 1899, the American Steel & Wire Co. came into the field as a purchaser of the business, but for the remainder of the year it was continued under the name of the Shoenberger Steel Co., with the following officers: Wallace H. Rowe, president; J. Ramsey Speer, vice president; Joseph McK. Speer, treasurer, and William L. Hirsch, secretary. The merger was completed by January, 1900.

* * *

THE manufacture of horseshoes was begun at the Shoenberger works in 1863. This branch of the business had a hard time in obtaining a foothold, the output being only 10,000 kegs in 1863. The only other horseshoe plant of prominence was that of H. Burden & Sons, Troy, N. Y. This concern had been in business for some years and had obtained a firm position, which it seemed impossible to overcome. During the Civil war Burden & Sons supplied the government with large numbers of horseshoes, and the blacksmiths so preferred their shoes that it was difficult to induce them to make a change. It was years before the Shoenberger Juniata brand gained popularity with the trade. Then it was necessary to build a second factory, and this was started on May 23, 1890, the output for the year being 83,087 kegs. In October, 1894, No. 3 factory was started, and the output for that year was 125,156 kegs. The company continually improved its plant and product, and in 1899, the last year of the Shoenberger ownership, the sales reached 241,697 kegs.

Originally the finishing process in the manufacture of horseshoes was by hammering the shoes, the hammers being of the wooden helve type. Steam hammers built by Thomas Morgan, founder of the Morgan Engineering Co., Alliance, O., were installed in 1871. Finally the hammer process was abolished and the bending and pressing method substituted.



THE TWO 5-TON BESSEMER CONVERTERS INSTALLED IN 1886 HAVE BEEN IN CONTINUOUS SERVICE, AND NOW ARE OPERATED AS 7-TON UNITS. THE NO. 1 BLOOMING MILL, INSTALLED IN 1877, ALSO HAS GIVEN GOOD SERVICE, AND STILL IS IN OPERATION

How Horseshoes Were Developed

Improvements in the processes and machinery came gradually. Many patents were taken out by men associated with the Shoenberger works, and others. In 1878 the right was acquired by the company to manufacture a shoe invented by Thomas Thistlewood of Sparta, Wis. This shoe was made with a strip of steel 1/16-inch thick running the entire length. The idea was that the iron being softer than hardened steel it would wear away and leave the steel projecting, thus producing a self-sharpening heel calk. The shoes were made successfully, and accomplished all the claims made for them, but the manufacture was discontinued because of the hostility of the blacksmiths. Many of the latter declared they would not buy shoes from the Shoenberger company if it continued manufacturing the improved type. One of them

wrote that the use of the shoes was hurting the horseshoers' business, and "depriving their children of bread."

Up to 1866 all horseshoes were made of iron and it was difficult to convince horseshoers that steel could be used to advantage. With the development of steelmaking, much experimental work was done to produce a soft, weldable material that would meet all the requirements of the trade and make a better shoe. Ninety per cent of all the Juniata horseshoes now are of steel. The 10 per cent are made from selected wrought iron scrap, mainly railroad material, and the process used at the Shoenberger works is novel.

Scrap Packed Into Faggots

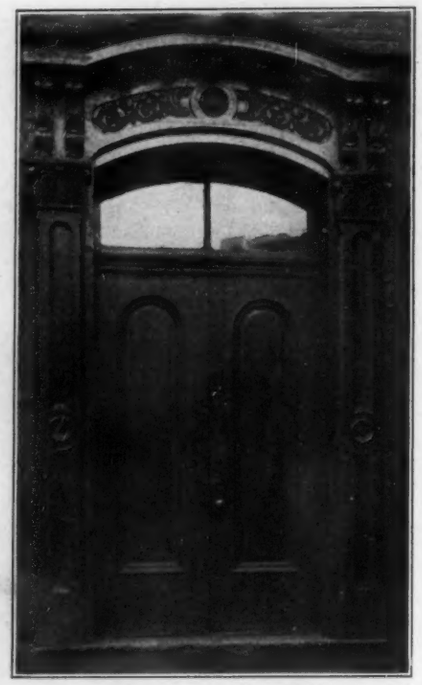
The scrap is cut or broken into short lengths, the pieces are packed by hand in a form and the bundle wrapped round with heavy wire. These bundles, or faggots, are about 8 inches square and 2 feet long, and weigh approximately 100 pounds. They are heated, and each faggot is taken from the furnace as a solid, white-hot mass and rolled into billets 1½ x 2 inches. The old steamboat engine referred to drives the mill.

From this step forward the making of horseshoes from iron or steel bars is substantially the same. The billets are reheated and rolled into horseshoe bars of various sizes. The bars are sheared to proper length and fed into bending and pressing machines.

Prior to 1886 or 1888 the only nails for general use that were manufactured in the United States were cut nails. There were a number of nail factories, the majority of them being located west of the Alleghenies, Pittsburgh and Wheeling, W. Va., being largely represented. The largest works in the Pittsburgh district was that of the Shoenbergers.

How Nails Were Made

Nail plate was produced on the nail mill in lengths of 15 to 20 feet, and of various gages according to the thickness of nails to be produced. The plates were sheared crosswise, in widths corresponding to the length of the nails. These were then taken to the nail machines, where the man or boy operating the machine placed them one at a time in a spring nipper, on the end of a wooden rod. The plates were fed into the machine, each alternate motion reversing the plate. This was the original hand-fed method, which was superceded by "self-feeding" machines. One man was enabled to operate three or four of these machines.



THE Shoenberger homestead in Pittsburgh, that once was "a mansion," now is part of the office building of the Shoenberger works, a reminder of the industry as constituted generations ago when "the master" lived close to his establishment and men. One of the old buildings in the group of fine homes serves as a storeroom. The colonial doorway, still in use, illustrates the type of architecture of some of these buildings, that have become part of "the oldest plant west of the Alleghenies."

* * *

IN A historical sketch of the Shoenberger works, the late Edward P. Loy, whose connection with the company began in 1868, gives the following as comprising plant and equipment in December of that year:

Two blast furnaces.

"Old mill," facing on Fifteenth street, which contained 12 puddling furnaces; one squeezer; two heating furnaces; one bar or billet train; and the following, which comprised the No. 1 horseshoe factory: Two heating furnaces; four benders and 10 hammers.

"New mill," facing on Sixteenth street, which contained 17 puddling furnaces; one squeezer; one 20-inch muck train; one sheet and plate train, finishing 48-inch chill and 60-inch soft; two heating furnaces; and the following which comprised the mill in which the plates were rolled from which the cut nails were produced: Three heating furnaces; one 18-inch train; three stands; one roughing and two stand chills of nail plate rolls.

Steel Cuts Puddled Iron Output

This article is the first publication of the official data of the Shoenberger works as contained in Mr. Loy's sketch. He says:

"One brick building faced on Pike street and extended from Fifteenth to Sixteenth streets (in 1868). This building contained 90 cut nail machines, with a product of 5000 to 6000 kegs of cut nails per week. The manufacture of cut nails was discontinued in 1888, and the nail machines scrapped. The building remained vacant until it was utilized for No. 2 and No. 3 horseshoe factories.

"The entry of steel cut into the production of puddled iron, and the starting of the bessemer plant meant the closing down of that part of the plant, as also did the cessation of cut nail manufacture mean the closing of the nail mill. These, however, were not torn down for some time thereafter, the 'old mill' about 1890 to erect the continuous mill, and the 'new mill' in 1897 when the 48-inch sheet mill and 22-inch skelp mill were built.

"The continuous mill was started about the summer of 1890. The 48-inch sheet mill was started about May 10, 1897, and the 22-inch skelp mill Sept. 22, 1897. In 1879 the following additions to the plant were made:

"Siemens open-hearth steel furnace. This remained in active service until torn down in 1899 or 1900 to make room for No. 2 blooming mill.

"One 60 or 72-inch plate mill, known as the Ashtabula mill from the fact that it was originally erected at Ashtabula, O., but was not a financial success. It was bought by the Shoenbergers, brought to Pittsburgh and added to the plant, the balance of the outfit being wrecked and sold.

"In 1886 the bessemer plant was completed, the first heat being turned out March 17 (St. Patrick's day). In 1881 the 112-inch plate mill was built,

Business History To Repeat Self?

AS THIS is a presidential year, an entry in a business chronicle of the Shoenberger works is noted with interest. Under date of 1876, *is written:*

"This being a presidential year, business was a little unsettled and sales (of horseshoes) were 32,459 kegs, a falling off of 2000 kegs from the previous year. There were no improvements made in methods or machinery this year."

Then, under date of 1877:

"The presidential question having been settled amicably, business resumed with confidence, and the horseshoe business boomed with a rush, and everybody put forth their best efforts to get out product. The sales this year amounted to 39,489 *kegs . . ."*

but owing to numerous machinery troubles was not in successful operation until 1883. May 23, 1890, No. 2 horseshoe factory was put in operation. October, 1894, No. 3 horseshoe factory was put in operation. During 1897 and January 1898, three basic open-hearth furnaces were built."

* * *

A BUILDING of brick with sidewalls 18 feet high, and ornamental ironwork surmounting chimneys and furnace stacks, is a glimpse of the works in the early sixties. In the side of one of the structures there were doors every 15 feet for facility in trucking by wagons to the railroad and river. The facades on the Fifteenth and Sixteenth street sides each contained a circular window under which a cast iron keystone was set, on which was inscribed "Established in 1824—Rebuilt 1859."

The railroad facilities of the early days were very limited, the only connection being the Allegheny Valley railroad, and this by trestle, for bringing in iron ore, coke and limestone. Much of the ore used was from Iron Mountain and Pilot Knob districts in Missouri, the ore being delivered by barges at the landing on the Allegheny river at the foot of Fifteenth street.

When the basic open-hearth furnaces were built, the company's office building was torn down, and possession was taken of the building on Penn avenue and Fifteenth street, which had been purchased from the estates of George K. and John H. Shoenberger.

General Charles L. Fitzhugh became president of the Shoenberger Steel Co. in 1894, *and was president when the company sold its interests in* 1899 *to the American Steel & Wire Co.*

This was known as the Shoenberger mansion and within its walls General William Harrison and other notables of the day had been entertained. The building is part of the present offices.

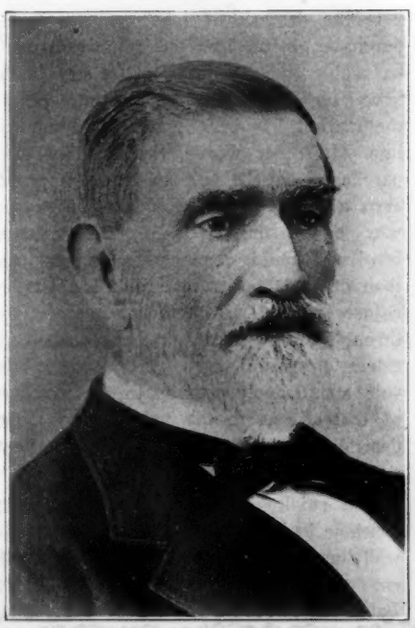
* * *

THE old Shoenberger works has its complement of old men, those who have grown up in its service. Some of them were born in the neighborhood. One of the workers was entitled to a pension a short time ago but word was sent to the general superintendent that he would not retire because he and the foreman knew that he was the best craneman they had. The head watchman is 72. He started work there in 1863. The superintendent of the horseshoe department is 62, and has been employed at the plant since he was 12. A steel pourer 63 years old has been employed since he was 13. Another "old timer" remembers the day when after his work was done his wife would cross the road and check the cars. The story of the Shoenberger works has an interesting human side.

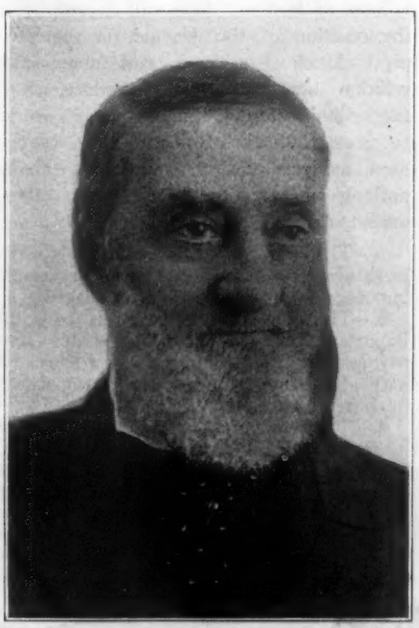
During the 100 years of its existence this plant has been singularly free from labor discord. In 1890, ten years before it was acquired by the American Steel & Wire Co., as a result of a difference of opinion between the owners and the Amalgamated Association of Iron and Steel Workers open shop principles were definitely established, and these obtain at the present time.

The metallurgical division of the bureau of standards, Washington, has started to prepare a report covering quenching diagrams of carbon steels in relation to quenching media for heat treatment. This report probably will be finished this month, and will be presented before the September annual meeting of the American Society for Steel Treating at Boston.

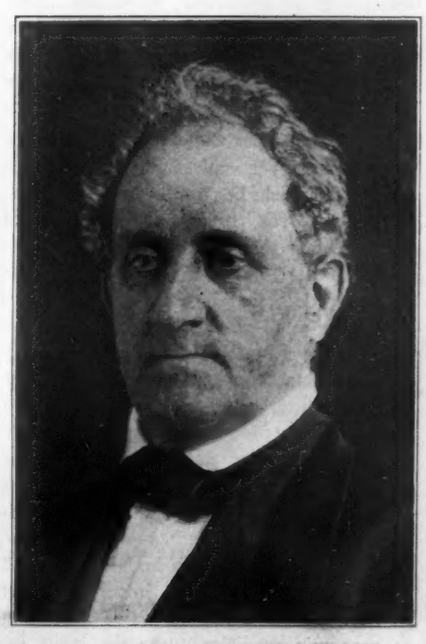
Early Generations in the Shoenberger Iron and Steel Plant Organization



JOHN H. SHOENBERGER



GEORGE K. SHOENBERGER



DR. PETER SHOENBERGER

Buying the Products of Labor

Fundamental Laws of Economics Should Apply, or Else There Are the Evils of Monopoly or Charity—Equal Opportunity and Freedom of Choice Are Workers' Safeguards—The Human Element Analyzed

BY ALLISON J. THOMPSON

MUCH has been said about labor not being a commodity of commerce, to be bought and sold. It must be apparent, however that labor is a service which one man wants to buy and another wants to sell. So while a service may not be a commodity, yet if it is performed for wages it becomes subject to fundamental laws of buying and selling.

That is a point where much argument and loose thinking arise, for many people hold to the opinion that when a commodity is bought it must be on the basis of the lowest possible price and the hardest possible terms, but with the buying and selling of labor a human life is involved, and a different rule should apply.

Obviously, it is the condition of human adversity that inspires our interest and sympathy. But we must not overlook the fact that the human element is present in every business transaction, whether the subject of the exchange is labor or a commodity. The people on either or both sides of the transaction may be involved in adversity and one side may be as deserving of sympathy as the other. If the farmer or the manufacturer, or any other employer of labor, cannot sell his product for enough to cover the cost of production taxes and other expenses, he may find the sheriff demanding an interview; then labor will have lost a customer and acquired a competitor. When a man loses his business the next most logical thing for him to do is to work for wages.

Let us remember that labor is worthless to the employer unless it accomplishes somethng which he wants to have done. In other words, it is only the product of the labor that is of any value whatever to the employer; and unless he gets a product that is useful to him there is absolutely no reason for employing the labor, other than for humanitarian reasons. While philanthropy is a valuable factor in civilization, and should be cultivated to a high degree, yet a nation prospers by its industry rather than as the object of charity or semi-charity; and industry must come first to provide means for philanthropy.

Work represents man's activity, his skill and his effort, his most important asset in life. It has a market value according to economic conditions. As the labor involved in the production of any commodity is cumulative the selling price at any stage of its production would be expected to represent the total of all the various sums paid for labor and material up to that point, plus whatever profits the market may have afforded to the various former owners. This does not always hold true, for at some one or more stages the business may have been handled at a loss.

Discusses Economics

THIS is the second article on the subject of labor economics written by the president of the Thompson Electric Co., Cleveland. The first article appeared in the July 10 issue of IRON TRADE REVIEW. *The purpose of the articles is to correct some "loose thinking" with respect to relation of labor to business. The author emphasizes the point that labor is a service; that it is the product of labor which is subject to the fundamental laws of buying and selling, and this natural condition will exist unless there is forced deviation by means of labor restriction.*

The cost of production is whatever it happens to be; the selling price and the volume of business done will depend upon the reaction of the demand on the supply. Much has been said about the relation of the cost of production to the selling price, and many people would be greatly shocked to learn that in the final analysis these two elements have nothing whatever to do with each other, except that:

1.—The cost of production is always something to talk about when contending for or against the price asked.

2.—The cost of production is of vital importance to the seller, to enable him to determine for himself how far he may dare to go in meeting competition or other conditions.

3.—The cost of production may have a sentimental influence upon the buyer. He may reason broadmindedly: "It costs so much to produce this thing. The seller of course must have a profit of some sort. It makes a pretty high price, but I guess we will have to pay it"—if he wants it badly enough; otherwise he is not interested, and there is no sale.

So the rule becomes easily apparent that the selling price is determined in the final analysis by how urgently the buyer wants to buy and how urgently the seller wants to sell; where those two lines cross is the selling price, regardless of the cost of production. That is exactly why so much more profit is possible on one article or line of goods than on another.

It is obvious that the buying power of the buyer and the holding power of the seller and the necessities of each may be among the factors influencing their desire to buy or sell.

The product of the labor may have great value in the hands of the employer or some subsequent purchaser because of the use which he may be able to make of it, just as any commodity may be, and naturally would be, worth more to the purchaser than to the seller. Purchases are usually made with the expectation of a profit.

Profit is the natural incentive for business activity. Without a prospective profit it is hardly conceivable that business enterprises would come into existence. It is equally certain that they could not be carried on and developed without capital, and the greater the capital the more extensively it can be employed in creating new demands for the products of labor. It is upon the activities growing out of business enterprises that the people live; and without them there would be no market for labor.

If the product of labor passes to the purchaser on the basis of its current market value, the producer or seller should have no cause for complaint, unless the market has been manipulated against him. In other words, the fact that the purchaser may be able to realize a profit, even a large profit, should be no reason why either the labor or the material involved should command a higher rate than other labor or material of a similar nature, except for personal reasons, or through humanitarian or benevolent consideration. And such exceptions to the rule would apply as well to the purchase of material as to the purchase of labor, depending upon who it is, and the circumstances.

The employer in general, if he is to continue in business, must buy his labor as well has his material in a manner consistent with the current market conditions. Labor is the thing done, not the man who does it. In the sale of labor the

workman, of course, must go along personally to deliver the product of his effort to the employer, and except in cases where it is understood that the workman is to supply his own working equipment the employer unquestionably should furnish suitable and adequate facilities and working conditions, having due regard for the nature of the work, and the station in life of the workman.

Safety and sanitation are two factors in working conditions that manifestly should be considered universally indispensible, the least that should be done in the matter of human consideration. And the worker should have sufficient regard for such provisions for his safety and comfort to use them in the spirit in which they are provided; at least he should refrain from abusing them.

While it is true that a certain amount of business is done on the basis of the lowest possible price and the hardest possible terms, yet it is equally true that personality, human interest and sentiment play a more or less conspicuous part in all human relations, and apply to the buying and selling of both commodities and service. For instance, one is apt to buy his meat, groceries, clothing or coal at certain places, knowing very well that he could get them elsewhere at lower prices, being influenced by any one or more of a number of considerations, such as greater confidence in the quality, a preference for the kind of business methods sometimes due to vanity, habit or environment and many times through a human interest in the seller, all of which factors also enter into the purchase of service, and for the same reasons.

We employ some people because we may have no choice. In such cases the factors involved will likely be confined more or less to a consideration of price, and quality of service, the element of human interest being to some extent negligible. Probably few people, however, have any sort of conception of the many instances when the employer makes substantial sacrifices on account of his human interest in his employes.

An engine is a product of labor combined with material; and the material represents mostly labor, transportation and marketing, from the ore, coal, etc., in the earth, on up to the finished product. The finished product of one man becomes the raw material in the hands of the next purchaser, whose finished product in turn becomes the raw material or equipment for the next man.

It will be seen that the labor which the wage earner sells to his employer becomes a part of that same "lifeless product" that is passed along through the various channels of trade by the manufacturer and merchant, accompanied by the human element. It also seems logical that the human element should be entitled to its proper recognition at each of the stages, whether the transaction involves an exchange of the product or further work to be done upon it. It does not seem reasonable that the subject of the transaction should make any difference in the relation or in the attitude of the parties toward each other.

The element of time has come into such common use for measuring work done by the wage earner that many people appear to have fallen into a habit of thinking that it is the only factor involved in the employment of labor; that time is the essential thing which the wage earner sells.

Except in a certain few industries or occupations the day is hardly a logical unit for the measurement of service or compensation, whereas the hour is a definite unit.

Manifestly the principle of "equal opportunity" should be construed constructively rather than restrictively if our nation is to have the benefit of the development of which it is capable. It should not be, in any sense, the province of the public to attempt to regulate the amount of labor the workman may be permitted to sell, especially as long as he is self-supporting.

No matter how great a supply of either commodities or labor may be in existence yet, if it is withheld from the market, the trade condition will be the same as if the supply did not exist. Constructive manipulation of supply and demand may prove to be a blessing to mankind, while destructive manipulation causes distress and should be discouraged. This should be borne in mind by those who are urging that the law of supply and demand should not apply to human relations.

Freedom of competition operates as a great equalizer, benefitting mankind so far as it safeguards against the tyranny of monopoly. A monopoly of labor by a portion of the people may prove as disastrous to the welfare of the nation as a monopoly of any commodity—possibly more so, whenever it retards industry and commerce, or deprives all except a certain class or group of people of the freedom to sell their services according to their ability on an equal footing in an open market.

Work is an honest man's ultimate recourse; and if deprived of the opportunity to sell the product of his effort he has nothing left but to starve, or to subsist upon charity. Equal opportunity, with freedom to choose, is one of the very important factors in the economic success of the individual, and therefore of the nation, for a nation cannot have any great degree of prosperity unless the individuals composing it are permitted to prosper.

The development of a civilization need not necessarily involve depriving the individual of any of his natural rights beyond the extent to which they may conflict with the proper exercise of similar rights by other people.

Over 500 at Conference on Human Rights

The growing spirit of co-operation between the various elements of industry was stressed at the recent industrial conference and school for executives at Estes park, Colorado.

J. A. Hiller, Chicago, through "Manpower in Industry" discussed various elements that enter into the industrial problem. Ex-Governor Henry J. Allen of Kansas discussed the Kansas industrial court and other legislative moves toward the establishment of industrial right.

Hal S. Ray, director of personnel and public relations, Chicago, Rock Island and Pacific railway, showed how a plan laid down by Mr. Hiller would work out in actual practice if the principals of a concern are sincere.

Judson G. Rosebush of Appleton, Wis. gave a series of lectures on "The Ethics of Profit Taking in Industry." He said "leaders in our present capitalistic system are in most instances looking on profits as a measure of success rather than as an end in themselves." His course of reasoning seemed to bear great hope that the goal of human rights will be reached under the present economic plan.

The meetings, July 18 to 26, were attended by over 500 men and women from 28 states representing 44 industries. They were held under the auspices of the Young Mens' Christian association.

Builds New Experimental Blast Furnace

A new experimental iron blast furnace, embodying all the best features determined by observation of the performance of other furnaces constructed by interior department specialists, has been completed and blown in the Minneapolis experiment station of the bureau of mines. The new experimental furnace is larger than the one constructed by the bureau at Minneapolis last year, the first successful experimental blast furnace in the history of metallurgy. It is expected that metallurgical studies made possible by the construction of the new furnace will reveal valuable informa-

tion relative to the production of spiegeleisen from manganiferous iron ores which cannot be smelted under present practice. Since the United States has tremendous reserves of these manganiferous iron ores, the problem of their successful smelting is one of great importance. The investigation is being watched with interest.

The present furnace, which was erected in co-operation with the University of Minnesota, is 36 inches in diameter at the hearth and 30 feet high. The first run lasted 10 days. Air was supplied to the furnace at the rate of about 600 cubic feet per minute, consuming approximately 8 tons of coke per day. From 15 to 20 tons of spiegeleisen of varying manganese content was produced during the experiments. Several hundred gas samples were taken from the interior of the furnace shaft by means of water-cooled sample tubes.

The most striking feature of the furnace experiment in contrast with previous one lies in the fact that a rather complete survey of the composition of the gas stream in the furnace shaft was possible. By introducing water-cooled sampling tubes through various test holes, it was possible to cover six planes completely. As early as 1839 Bunsen determined the composition of the gas in the blast furnace at various elevations from the tuyere to the stock line. His results have been duplicated in a dozen or more investigations. In all this research samples were taken from only one point in each horizontal plane. During the thirty-fourth and thirty-fifth runs with the bureau of mines furnace over 1000 gas samples were taken at five elevations in the furnace shaft. These samples, however, all lay along a single diameter of the furnace section. The necessity of sampling over a complete section long has been recognized, but the difficulty of obtaining such samples in practice has heretofore not been overcome.

A considerable number of samples of raw materials, slag and metal taken during the run, await analyzing. A study of the analyses of these samples, as well as the samples of gas removed from the charge column with the furnace, should throw considerable light upon the mechanism of the gas reactions taking place within the blast furnace shaft and should result in the obtaining of much valuable information relative to the production of spiegeleisen from manganiferous iron ores.

Competing Plants in Safety Contest

BY GEORGE A. BRAYTON

THERE are three outstanding features of the safety contest now going on between the American Rolling Mill Co., Middletown, O., and the Newport Rolling Mill Co., Andrews Steel Co., the Globe Iron Roofing & Corrugating Co., and Newport Culvert Co., all at Newport, Ky.

The fact that two competitive corporations, operating similar plants, should stage a contest in the work of accident prevention shows the grip this work has on modern business executives. The second feature is the fact the Newport Rolling Mill is nearing the goal in an accident prevention campaign, which it has been carrying on for the last year, and more especially the last five months. The organization has 1800 to 2500 employes, almost all new men, a very large number of whom came to the mill direct from the farm and hillside, with little conception of what mill work is and practically no idea of self-protection against accident in new and unusual surroundings. The third feature, and perhaps the most important, is the zeal with which the men have taken the opportunity to make safety first a vital part of their work.

At our plant, the Newport Rolling Mill, we started on the first of this year a vigorous effort to cut down the accidents we had been experiencing, which were due largely to breaking in an entirely new organization, even to over half of our force of foremen. Lost time accidents in 1923 averaged a little over 25 per month. Starting on our campaign, we inaugurated a monthly safety dinner, in addition to our regular weekly foremen's meeting. Superintendents, foremen and keymen of our plant attended these dinners. Accident prevention was the only subject discussed, and by these efforts, through the foremen, the accidents were cut down successively from 21 in January to eight in April.

About this time, the American Rolling Mill Co. was staging a campaign at its plant at Middletown. Some of our men visited that plant, and the outcome was a direct challenge to Middletown for a contest in accident prevention. This was accepted, and to make the contest fair, the Andrews Steel Co., the Globe Iron Roofing & Corrugated Co., the Newport Rolling Mill Co., and the Newport Culvert Co., all of Newport, combined their efforts on one side, and the American Rolling Mill Co., Middletown plant, on the other. This brought plants having steelworks, blooming and bar mills, sheet and jobbing mills, galvanizing and roofing departments on each side.

THE BLACK CAT AFTER FIRST TWO DAYS, SHOWING WHITE STRIPES, FOR SAFETY, BEGINNING TO DISPLACE THE BLACK

A lost time accident was defined as one in which the injured man was unable to assume his regular duties without help on the day following that on which the accident occurred, or one in which compensation was paid to the employe, regardless of whether he lost any time.

Our mills at Newport were each divided in groups, in general according to the class of work the men performed. Chairmen were selected for each group from among the workmen, who in turn selected their committeemen. These committees were given the power to stop any unsafe practice seen by them, and were the leaders of their groups through the campaign. The groups were pitted against each other to make a record for the month of May.

On May 1 the plants were decorated and "plastered" with safety signs, slogans, descriptive sets that gave them the appearance of a county fair, all made by the workmen of the various

The author is chairman, safety committee, Newport Rolling Mill Co.

groups. Every one who entered the plant was compelled to wear a badge, cap or other insignia, with his group number, showing he was "safe" and able to take care of himself.

This probably was the most effective weapon against accident, as it continually impressed every workman with the importance of safety. A large electric sign proclaiming Safety First was installed in a conspicuous place, while directly over the gate was a sign demanding that anyone not safe must stay out. An electric sign with 31 lights, outlining the word MAY was started with white lights. Every day on which no accident occurred a green light was substituted for a white one, and when an accident occurred, a red one was substituted.

Novel Stunts Are Originated

Old Man Carelessness, much bandaged, spotted with red paint, limped through the plant on crutches, chased by a natty workman representing Safety First. This was on April 30. On May 1 an imitation grave appeared with a tombstone declaring that Old Man Carelessness was buried forever. Another group hung Old Man Carelessness from a pole on a boat in the reservoir, and drowned him, inch by inch, as the month went on without accident to one of their group. Still another group took a dummy, Old Man Carelessness, and putting it under the skull cracker crushed it to bits. This group has not had an accident since.

A large black cat with electric lights for eyes was erected in front of the main entrance. A strip of white was painted across the cat for each day there was no accident, and on the two days in which accidents did occur the colors of the group having the accident were painted on instead. A donkey, proclaiming he was a jackass and did not believe in safety, was cut out of wood and was stood up near a draft horse bearing words to the effect that he was no jackass and did believe in safety.

Electricians built an imitation electric chair to electrocute any careless workman. Another group started a dummy up a ladder of 31 steps, representing each day of the month, and advancing him a step for every day no accident occurred. They sat him on the top at the end of the month, waving a flag and proclaiming the fact with a big sign that they had gone "Over the Top." This same group sent up balloons with safety slogans, with stamped return cards attached. Many of the cards were returned from points more than 40 miles away. Another group had Old Man Carelessness caged in a cell with signs proclaiming the uselessness of any attempt to get bail.

One of the best features was the tableau of children, represented by dolls, at play, overtopped with a sign reminding "daddy" that he must come home unhurt.

The workman's committees investigated all cases of carelessness, and tried the offender in regular court procedure. In some cases men were recommended to be laid off for a period, and in others discharge was recommended. The management in all cases adopted these recommendations.

At the end of May a large scoreboard at the main gate showed two slight lost time accidents at the Newport Rolling Mill, as compared with a total of 53 for the four months previous. There also was one such accident at the Andrews steel plant, compared with 17 in the four months preceding.

The American Rolling Mill at Middletown had two slight lost time accidents and one fatality, thus making the contest a tie with a score of 3 to 3.

As so much interest was aroused among the men it was decided to continue the contest indefinitely. The result for June was: Newport Rolling Mill Co., five accidents; Andrews Steel Co., two accidents, and American Rolling Mill Co., six, or a score of seven to six, in favor of the American company. For July the score was: Newport Rolling Mill, one accident; Andrews Steel Co., four, and the American company, six; or a score of five to six in favor of the Andrews company and the Newport company. Thus the two sides were tied for the three months.

The greatest feature is the fact that all these plants have reduced their accidents 75 per cent by the methods described. This has been done without any decrease in production, and with a decided improvement in the quality of the work and interest of the men in all things pertaining to the betterment of the plant.

Considerable help was extended by the Cincinnati Chapter of the National Safety council. Dr. O. P. Geier, president, and Dr. W. A. Moore, director, took time to address employes.

Makes Physical Tests At High Temperature

During the past month six additional high temperature tensile tests were made by the bureau of standards, Washington on samples which had been subjected first to water quenching from 1830 degrees Fahr. and tempering at 1200 degrees Fahr. These tests were carried out for a manufacturer of high chromium copper steel. The results of this treatment are a somewhat higher proportional limit at ordinary temperatures than is obtained from the water quench without subsequent tempering, but at elevated temperatures practically identical results were obtained. About 45 drop tests were made at temperatures between 1800 and 2200 degrees Fahr. on a series of nickel-chromium stels, as part of the study of air hardening of rivet steels.

Find Most Workers Have Defective Vision

Over half the workers in the United States engaged in building our motor cars lack normal vision, investigations by the Eye Sight Conservation Council of America reveal. Similar conditions, it is asserted, exist among millions employed in other enterprises. Tests carried out by the Buick Motor Co. at its plant in Flint, Mich., in co-operation with the council, show, as reported by R. F. Thalner, safety director of the personal service department of the company, that 56 per cent of new employes have defective eyesight.

Working with the council in its nationwide campaign of eye conservation, the Buick company is testing the eyesight of each applicant for work, the results being recorded daily on the personal record cards of employes, who at this time total 24,451.

The situation at the Buick plant, followed similar revelations at the Ford works in Detroit, and at other large industrial establishments. The council, in its report, says:

"The results of eyesight tests of the 3513 applicants for employment with the Buick company may be considered as a representative standard of measurement not only for the entire automobile industry but for persons engaged in other industrial pursuits. The persons examined at the Flint plant came from many different types of occupations seeking employment in the great variety of jobs to be had in a large plant manufacturing a highly complicated product."

The complete figures on the Buick company's tests for four months show that only 194 or 5.5 per cent of this group of 3513 had their vision corrected while 1970 or 56.1 per cent were in need of correction.

"The proportion of defective vision found by the Buick company," the report declares, "closely approximates that generally found among any group of workers, when similar tests are made. This proportion is based upon the results of simple tests. More careful examinations of other large groups of employes of industrial plants and commercial establishments show that fully 66 per cent have defective eyes. It is regrettable that not more than 100 or 150 companies in the United States employing upwards of 1000 persons consider it essential to test the eyes of applicants. Still fewer carry on this activity periodically for permanent employes."

Dismantling Old Stacks by Blasting

BY J. R. BRIGGS

Fig. 1—View of one of the old Saucon furnaces of the Thomas Iron Co. at Hellertown, Pa., a few seconds after a charge of dynamite was exploded. The weight of the falling iron and brick was estimated at 600 tons

SINCE the acetylene torch became a commercial success, scrapping of steel structures of all kinds has assumed the proportions of an industry. By this method it is possible to dismantle structures with facility and economy. The problem is not as difficult as in the days when thousands of rivets had to be cut and when this kind of work was much more expensive. As a result, valuable scrap is cut into marketable sizes and sold at a profit, and the sites occupied by obsolete establishments are made available for other use.

The author, John R. Briggs, is president, Henry Potts & Co., Philadelphia.

Scrapping of blast furnaces has become an important business, due to the rapidity with which old furnaces in recent years have reached the stage when they no longer could be operated at a profit. According to the compilations of the American Iron and Steel institute, 14 blast furnaces using mineral fuel and four using charcoal, were abandoned or dismantled in 1923. The methods employed in dismantling blast furnaces vary somewhat according to the individual conditions, but in general are the same. The furnace and other units first are blasted with dynamite, after which the material is prepared for the market. For this work a large amount of equipment is necessary, including a shifting locomotive, locomotive crane, hoisting engine, acetylene torches, and various small tools. Roughly, it takes a gang of 20 men about six months to dismantle a furnace. In order to reclaim the valuable scrap, it is necessary to handle a considerable quantity of materials having no commercial value. This adds greatly to the labor costs, which is the principal item of expense. Thus the cost of doing the work varies with each individual plant, so that the salvage value cannot be estimated on any set basis.

Approximately 1000 to 1200 tons of

FIG. 2—APPROXIMATELY 50 POUNDS OF EXPLOSIVE MATERIAL IN STICK FORM WAS PLACED AROUND THE CAST-IRON COLUMNS SUPPORTING THE SHELL OF THE FURNACE. FIG. 3—DETONATOR USED FOR SETTING OFF THE EXPLOSIVE MATERIAL

iron and steel scrap are being reclaimed from furnaces of the type which at the present time have become obsolete. The grades of scrap obtained include heavy melting steel, heavy breakable cast, cupola cast, wrought, low phosphorus, pipe, tubes, shafting, etc. The tonnage varies considerably, according to the size and lay-out of the plant. It depends on the construction of the stoves, the size of the blowing engines, the outside equipment, trackage around the plant, etc.

Henry Potts & Co. has done considerable work of this kind in recent years. In 1914 it purchased and dismantled the old 16 x 70-foot stack of the Bellefonte Furnace Co., at Bellefonte, Pa., which originally was built in 1887. It now is completing the demolition of the No. 4 furnace of the Shenango Furnace Co., Sharpsville, Pa. The Potts company dismantled the old Anvil furnace of the Pottstown Iron Co., Pottstown, Pa., in 1923. In addition to blast furnaces, the Potts company specializes in the dismantling of all kinds of plants, including steelworks, street railways, barges, producer gas plants, ore mines, collieries, power plants and other establishments in which the steel is worth reclamation.

The stack shown in Fig. 4 was one of a group of two known as the Saucon furnaces located at Hellertown, Pa., which were purchased by the Thomas Iron Co. during the latter part of 1884 from the Saucon Iron Co. One stack was 50 feet high with a 16-foot hearth and started its first campaign March 25, 1868. It was operated for a number of

FIG. 5—REMAINS OF THE STACK AFTER THE EXPLOSION. THE STRUCTURAL MATERIAL STANDING IN AN UPRIGHT POSITION FORMERLY WAS THE ELEVATOR TOWER. A SECTION OF THE SHELL IS SHOWN RESTING UPON THE PILE OF BRICKS

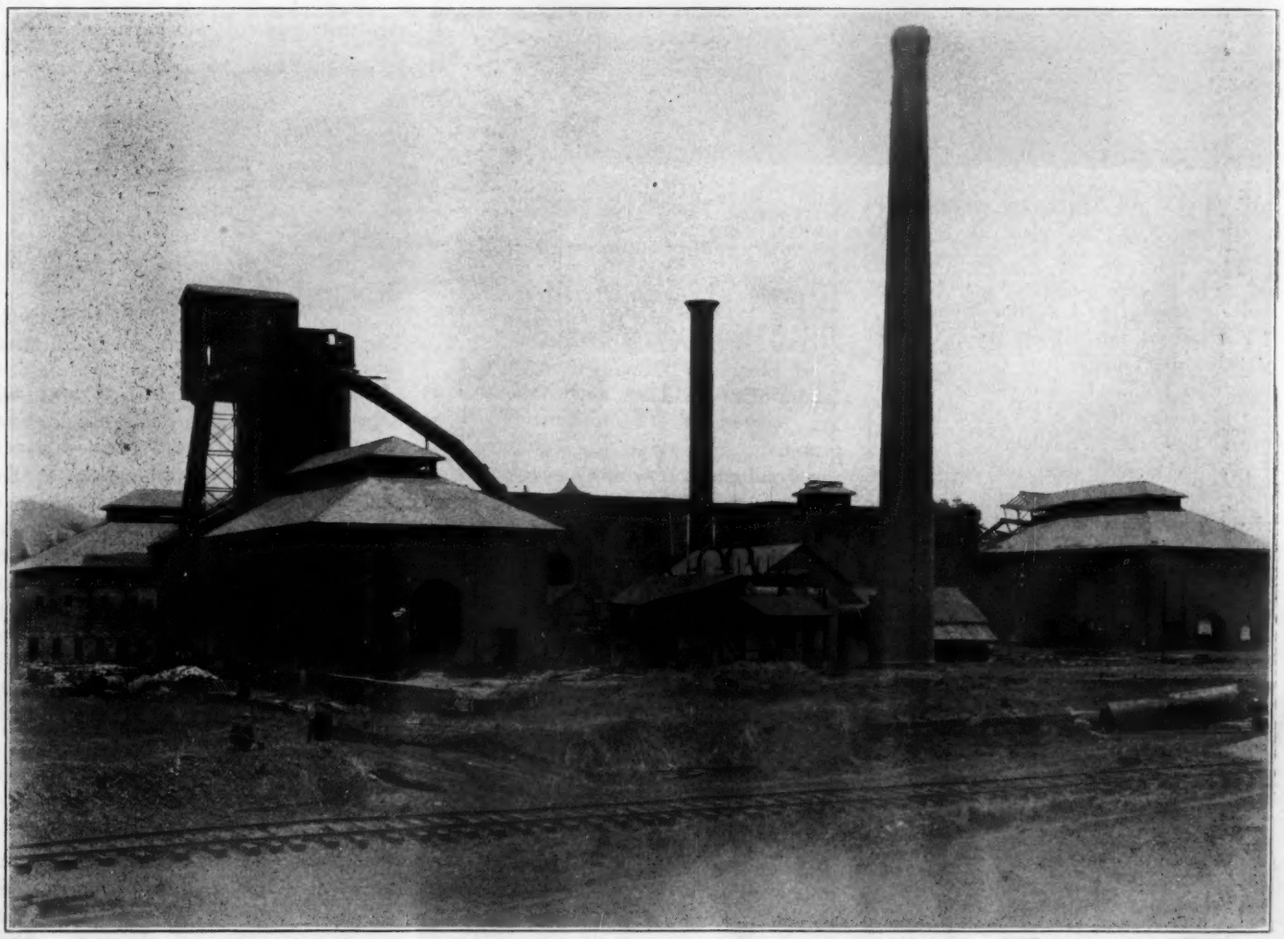


FIG. 4—LAST STACK OF THE SAUCON GROUP OF BLAST FURNACES AT HELLERTOWN, PA., AS IT APPEARED BEFORE BEING DEMOLISHED WITH DYNAMITE. DURING EARLY CAMPAIGNS IT WAS OPERATED AS AN OPEN TOP STACK

years as an open top stack. During 1894 it was enlarged to 16 x 75 feet. The cast house, which served this furnace, is shown at the extreme right in Fig. 4. The other stack of the old Saucon group, which is shown at the left of Fig. 4 prior to its being blasted with dynamite, was 60 feet high and had a 16-foot hearth. The stack was completed May 25, 1870 and was operated on hot blast, the air being heated in iron pipe stoves. The top was equipped with a bell and all stock was hoisted by a double-cage elevator. The stacks were burdened largely on foundry and forge irons using Saucon valley and New Jersey magnetic ores. An interesting sidelight in connection with this plant is that the stacks, as far as can be learned, were the first in this country to have their shells supported by cast-iron columns.

The last of the Saucon group of furnaces of the Thomas Iron Co., at Hellertown, Pa., now is undergoing demolition by Henry Potts & Co., 1608 Bankers Trust building, Philadelphia. Fig. 2 shows the method used for planting the sticks of dynamite around the base of the cast-iron columns. Approximately 50 pounds of the explosive was used at the various column locations. A detonator, shown in Fig. 3, was employed for setting off the charge of explosive. The effect that 50 pounds of dynamite had on this stack is shown in Fig. 5. The structural material standing in a nearly vertical position is the remains of what formally was the elevator cage. The shell of the stack and a few of the old cast-iron columns can be seen in the foreground.

The Columbian Iron Works, of Chattanooga, Tenn., has arranged with the Metropolitan Life Insurance Co., by which insurance has been provided for approximately 150 employes. The total amounts to $168,000. S. Vesset & Co., machinists and patternmakers, of Joliette, Quebec, have presented each of their employes with life insurance, in amounts from $500 to $2000.

British Association Has Research Laboratory

The British Cast Iron Research association recently reached another important stage in its development when it formally took possession of its own laboratories. The new laboratories are located on Guidford street, Birmingham, Eng., and are equipped for the conduct of chemical analyses and general metallurgical and heat treatment work. As a result, the capacity of the association to deal with its work will be increased greatly, however, it is not intended to abandon the policy of having investigations conducted in prominent university laboratories and in the works of members.

It is expected that the association, which started a new financial year July 1, will incur an expenditure during the year of between £6000 and £7000. The research program includes important investigations on erosion and corrosion-resisting cast irons; molding sands; graphitization; heat-resisting cast iron; production of malleable cast iron; cupola practice; cast irons for electrical and magnetic purposes; measurement of melting and pouring temperatures; fundamental properties of cast iron; standardization of test bars, materials and methods; facing sands and blackings; cast iron to resist abrasive wear; and jointly with the British Motor and Allied Manufacturer's Research association, automobile cylinders and pistons.

Welds Bridge Reinforcing by Arc Method

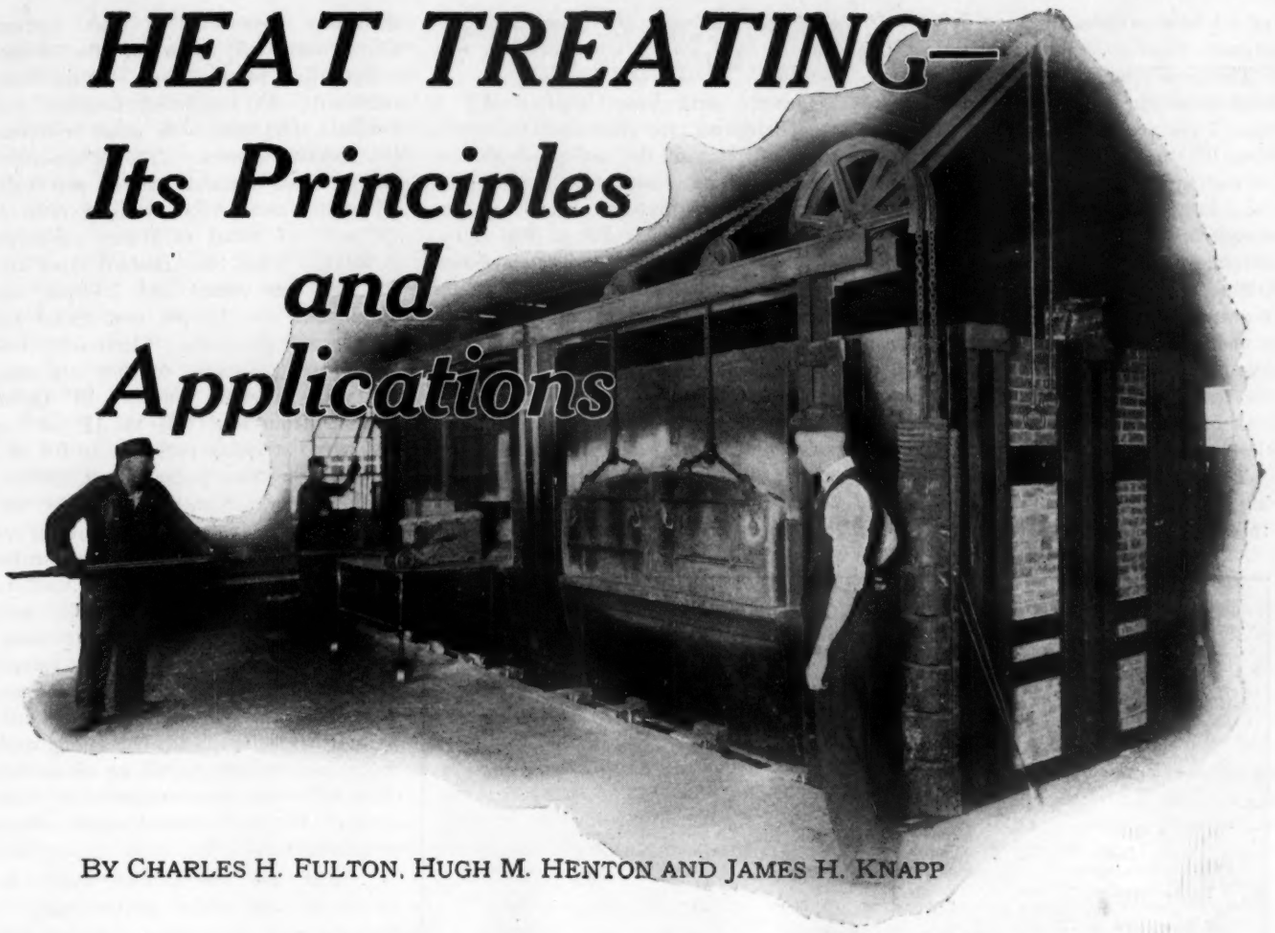
A reinforced concrete bridge recently completed on the outskirts of Toronto, Ont., is unique in its design and construction in that the steel reinforcing bars are joined together by electric welding. The accompanying photograph, Fig. 1, shows the bridge during the process of construction. Fig. 2 illustrates the method by which the 2½-inch steel bars were welded. As shown in the upper view of Fig. 2, the two ends of the bar were beveled and brought together, then welded. A short or muff coupling next was hammered into place on the bar and this also was welded, as shown in the lower view.

The bridge, which is designed to carry the full load of modern road traffic, has approaches about 700 feet long, the length of the bridge itself being about 500 feet. The structure is so designed that the reinforcing steel will carry the load alone. However, the concrete provides additional strength and, in addition, serves to protect the steel, prevents deflection of the members and finally gives the finished bridge a pleasing appearance. The total cost of the structure was $80,000, of which $1500, or less than 2 per cent, represented the welding cost. The concrete required was 2000 cubic yards.

Use of electric welding for a structure of this character emphasizes the dependence which now is being placed on electric welding. The welding apparatus used on this job was manufactured by the Lincoln Electric Co., Cleveland. It can be seen as the small dot about midway of the main arch in Fig. 1.

FIG. 1 (UPPER LEFT)—REINFORCED CONCRETE BRIDGE IN WHICH STEEL BARS ARE ELECTRICALLY ARC WELDED. FIG. 2 (LOWER RIGHT)—THESE VIEWS SHOW THE METHOD OF MAKING THE WELDS

HEAT TREATING—
Its Principles and Applications



BY CHARLES H. FULTON, HUGH M. HENTON AND JAMES H. KNAPP

Chapter VIII—The Heat Treatment of Alloy Steels (Continued)

CHROMIUM steels containing up to 0.75 per cent chromium and carbon up to 0.75 per cent are used rather widely for certain tools, such as jaws of wrenches, well bits, chisels, etc., and with carbon somewhat higher than 0.75 per cent for drills, knives, razors, files, etc. Chromium steels containing from 1.0 to 1.75 per cent chromium, and carbon from 0.9 to 1.20 per cent are used for ball bearings, ball races, roller bearings, wearing parts of crushing machinery, steel for safes and in general for parts requiring an extremely hard surface. Chromium steels containing 2 to 3 per cent chromium and relatively high carbon are used for armor piercing projectiles, cold rolls, drawing dies, special files, etc. The effects of chromium on the critical points seems to be the lowering of the A_3 point and the final obliteration of this point, and the raising of the A_1 point. The addition of chromium up to 4.05 per cent raises the Ac_1 point from 743 to 791 degrees Cent., (1369 to 1456)* and the Ar_1 point from 671 to 748 degrees Cent., (1240 to 1378).

The formation of pearlite from austenite and, conversely, the absorption of pearlite into austenite in a chromium steel takes more time than in a carbon steel and a relatively long heating is required to equalize the steel. Chromium dissolves both in the iron as a solid solution, and forms double carbides with iron. It is found, therefore, both in the pearlite and in the excess substance of the steel. Chromium steels relatively high in carbon, can be made extremely hard by quenching. With this hardness is combined a great toughness due to general fineness of structure, in which last respect the steel is similar to nickel steel.

Prolonged heating of chromium steel for equalizing it previous to the hardening, has a bad effect on the steel, since different to nickel steel, this effects a coarsening of the structure. For this reason, in hardening, the double treatment is required for the chromium steels, the first higher heating to cause equalization, followed by quenching to prevent the reseparation of cementite, then a heating to just above the critical point, for refining the grain, and again quenching, followed by drawing.

Chromium steels of relatively low chromium content, 0.5 to 0.75 per cent and carbon from 0.35 to 0.75 per cent are frequently heat treated as follows: Heated to 790 to 815 degrees Cent., (1450 to 1500) then quenched in water, and then drawn or tempered by heating to 540 to 700 degrees Cent., (1000 to 1300) for toughening. Or they may be quenched in oil from the same temperature, but drawn

Chromium Steels Are Discussed Here

HEAT treatments required by chromium and nickel-chromium steels are outlined in this installment, the second of three installments of Chapter VIII, dealing with alloy steels. Chapter I of the series appeared Oct. 4; Chapter II was published in the issues of Oct. 18, Nov. 1 and Nov. 15; Chapter III in the issues of Nov. 29, Dec. 13 and Dec. 27; and Chapter IV in the issue of Jan. 10. Chapter V appeared in the Jan. 24, Feb. 7, Feb. 21, March 6 and March 20 issues. Chapter VI appeared April 3, April 17, May 1 and May 15. Chapter VII appeared May 29, June 12, June 26, July 10 and July 24. Chapter VIII appeared Aug. 7.

Charles H. Fulton is director of school of mines and metallurgy, University of Missouri; Hugh M. Henton is consulting metallurgical engineer and assistant professor of metallurgy and mining, State College of Washington, and James H. Knapp is industrial engineer, Los Angeles.

*The figures in parentheses represent temperature in degrees Fahr.

at a lower temperature, say 500 to 600 degrees Cent. (930 to 1110).

The chromium steels used in the hardened condition are those containing more than 1 per cent chromium and high carbon, 0.9 to 1.2 per cent. When parts of such steel are to be machined, the steel must be specially annealed as otherwise it cannot be cut. In order to machine this chromium steel, it is necessary to distribute the very hard iron-chromium cementite throughout the steel uniformly in a fine state of division by suitable annealing. This amounts to the spheroidizing of the cementite, not only that present as excess cementite, but also the cementite of the pearlite.

This is brought about by a long heating at or slightly above the critical range, followed by a slow cooling through the critical range. For a steel containing from 0.9 to 1.2 per cent carbon and 1.00 to 1.6 per cent chromium, the annealing treatment should be as follows: Heat uniformly to 900 to 925 degrees Cent. (1650 to 1700) and hold at that temperature for about 6 hours, and then cool rapidly in air. This will bring about the absorption of the cementite and prevent its separation in a coarse condition on cooling. Then heat slowly and uniformly to 745 to 775 degrees Cent. (1375 to 1425) and hold for 10 hours at this temperature, then cool very slowly at a rate not exceeding 10 degrees per hour for the first 30 hours. Continue the slow cooling in the furnace. The higher temperatures refer to the steels with the higher chromium content.

After machining steels annealed in the manner described, they may be hardened by heating to 787 to 815 degrees Cent. (1450 to 1500) and quenching in water, and then drawing back at a temperature of 177 degrees Cent. (350) or a higher temperature for greater toughness and less hardness. Oil quenching may also be used with a lower drawing temperature.

Chrome steel lends itself readily to case hardening, the chromium facilitating the absorption of the carbon, in this respect differing from nickel. The case hardening temperatures are the same as for nickel, namely 900 to 950 degrees Cent. (1650 to 1750). The prolonged heating of the chromium steel at this high temperature, however, coarsens the structure much more than nickel steel, so that the double quenching treatment as described always must be applied to chromium steel. Chromium, like nickel, raises the elastic limit, without a decrease in elongation or reduction of area, found accompanying this increase in the elastic limit in a carbon steel. The accompanying data gives figures on the physical properties of a steel of medium chromium and carbon content:

Table XIX

Properties of Nickel-Chromium Steel

CHEMICAL PROPERTIES

No.	Carbon per cent	Manganese per cent	Silicon per cent	Phosphorus per cent	Sulphur per cent	Nickel per cent	Chromium per cent
1	0.3-0.4	0.4-0.6	0.25	0.025	0.025	1.25-1.75	0.5 -0.8
2	0.4-0.5	0.4-0.6	0.25	0.025	0.025	3.25-3.75	1.25-1.75

TREATMENT AND PHYSICAL PROPERTIES

No.	Heat treatment	Tensile strength, pounds per square inch	Elastic limit, pounds per square inch	Elongation per cent	Reduction per cent	Brinnell hardness
1	Annealed at 737 degrees Cent. (1360)	75,000	38,000	28	55	165
2	Annealed at 725 degrees Cent. (1340)	90,000	58,000	26	60	175
1	Quenched in oil at 840 degrees Cent. (1550). Drawn at 540 degrees Cent. (1000)	180,000	162,000	12	45	370
2	Quenched in oil at 840 degrees Cent. (1550). Drawn at 480 degrees Cent. (900)	201,000	159,000	12	39	402

Analysis

	Per cent
Carbon	0.64
Manganese	0.28
Silicon	0.17
Chromium	1.04

Physical Properties

Heat Treatment: Quenched in oil from 871 degrees Cent. (1600) and drawn at the temperatures shown below

	Drawing temperature, degrees Fahr. 750	930	1100
Tensile strength, pounds per square inch	227,500	212,000	186,000
Elastic limit pounds per square inch	170,000	155,000	127,500
Elongation, per cent in 2 inches	5.0	8.0	10.0
Reduction in area, per cent	13.5	19.5	22.5
Brinell hardness	477	444	387

Nickel-chromium steels have a wide use, for when chromium and nickel are combined in a steel, the good effects of both the constituents are obtained, without the disadvantages of the use of either element alone, such as the non-uniformity or flakiness sometimes found in nickel steel, or the brittleness of chromium steel due to high heating. Chromium-nickel steels of the proper composition possess high elastic limit combined with toughness, ductility, and hardness, and also with great resistance to fatigue stresses. The composition varies rather widely, but in practically all of the commercial steels, a ratio of 2.5 parts of nickel to 1 part chromium is found. Thus, two standard types are: 3.5 per cent nickel and 1.5 per cent chromium; and 1.5 per cent nickel and 0.6 per cent chromium. Steels with these nickel and chromium contents are made up with different amounts of carbon content, from low, 0.05 to .15 per cent for case hardening purposes, to 0.6 to 7 per cent for other purposes not requiring hard surface. Sometimes a steel with chromium as high as 2 per cent and nickel as high as 4.5 per cent, carbon from 0.25 to 0.40 per cent, is used for parts subjected to heavy loads, great fatigue stresses and wear, but where great ductility is not required. Examples are certain gears and pinions, connecting rods, or shafts. Such steels are known as self-hardening, nickel-chromium steels, since they are martensitic on air cooling. The following heat treatment is recommended for the standard nickel chromium steels:

1. For the steels with the lower chromium and nickel content and low carbon used for parts requiring case hardening. Carburize at a temperature between 900 to 925 degrees Cent. (1650 and 1700) for a time to produce proper thickness of case. A case 0.04 inches thick will be produced in 2½ to 3 hours if the proper carburizing mixture is used. Cool slowly in the carburizing mixture. Reheat to 815 to 840 degrees Cent., (1500 to 1550) and follow by quenching in oil or water. Reheat again to 700 to 760 degrees Cent. (1300 to 1400) and quench in oil or water. Then temper or draw at 120 to 260 degrees Cent., (250 to 500) dependent on the hardness of the case desired and cool slowly.

For parts which are not case hardened, but which are used in the toughened condition, the heat treatment is as follows: After forging or machining, heat to 815 to 845 degrees Cent. (1500 to 1555) and cool slowly, then reheat to 787 degrees Cent. (1450) and quench in oil or water, then reheat to 315 to 650 degrees Cent. (600 to 1200) according to the physical properties desired, and cool slowly.

2. For the steels with the higher chromium and nickel content and carbon up to 0.50 per cent. Such steels with carbon of 0.15 to 0.25 per cent may be case hardened by the same treatment as described above, except that the reheating after carburizing is 25 to 50 degrees

Cent. (50 to 100) lower. The higher carbon steels used in the toughened condition must generally pass through an annealing before they can be machined satisfactorily, and hence the following heat treatment is recommended. After forging, heat to 815 to 840 degrees Cent. (1500 to 1550) and follow by quenching in oil. Then reheat to 650 to 700 degrees Cent. (1200 to 1300) and hold at this temperature for 3 hours and allow it to cool slowly. The parts may then be machined, and are then reheated to 745 to 775 degrees Cent. (1375 to 1425) and quenched in water or oil, followed by reheating to 120 to 290 degrees Cent. (250 to 550), dependent on the physical properties desired and allowed to cool slowly.

The physical properties of the nickel-chromium steels are exemplified in Table XIX. It will be noted that there is but little difference in the static physical properties between the steels of lower nickel and chrome content and those of the higher. There is a decided difference, however, in favor of the higher content nickel-chrome steel in the resistance to fatigue and shock stresses, and such steels are widely used where such stresses must be resisted, as in very heavy duty gear, armor plate, and similar material.

Germany Arranges Second International Fair

The second Danzig international fair, which will be held at Danzig, Oct. 2-5, already is attracting interest throughout Germany. It is claimed this will prove to be one of the most important fairs ever held in Germany, particularly in connection with agricultural machinery. In addition to German companies Austrian, Hungarian, and other foreign manufacturers of agricultural machinery are expected to exhibit. Rhineland and Westphalian interests will be well represented. A special depot already has been established in Cologne in connection with the fair.

A traffic exhibition is to be held at Munich next year between June and October, with the principal object of educating the German public on the economic and commercial importance of a reconstruction of traffic conditions and to emphasize the interdependence between traffic and trade. All varieties of traffic, including inland railroad and street communication; canal, river, and ocean navigation; air traffic; and postal, telegraph, telephone, and wireless operations, will be represented. The municipal exhibition grounds of Munich, with an area of 240,000 square meters, including six halls with a floor space of 21,000 square meters, will be placed at the disposal of the traffic exhibition authorities, thus avoiding the cost of erecting special buildings.

In connection with recent German legislation regarding hours of work in factories, further modifications have been adopted in consequence of disputes which have arisen, including the following: Night work for female and junior workers is to be avoided, as also are unusually early and late shifts wherever possible. Thirty days overtime per year can be required from each worker as a minimum and this may be done on 30 consecutive days if more convenient to the employer. Overtime may be required of an employe without previous notice having been given but it is recommended that previous notice shall be given whenever possible so that a worker may be enabled to arrange accordingly. On the other hand, he can be dismissed for refusal to work.

It is reported in Germany that German agents in Athens have made an agreement with the Greek foreign ministry whereby preference will be shown to German ships in Greek ports and to German articles of export, in return for an equal preference on Greek imports into Germany.

Taking Roll Samples Requires Care

WITH the constantly increasing importance attached to the chemical analysis of rolls, all operators should use utmost precaution in obtaining the sample correctly so that all possible causes of error which might be traced to mechanical slips, may be eliminated, says *United Effort*, a publication of the United Engineering & Foundry Co., Pittsburgh. An improperly gathered sample will produce an improper analysis even before the chemist weighs the amounts for determinations. Dirt, grease, sand, scale, blacking, or facing when placed in the sample cause losses or gains in graphite, mechanical errors that should be avoided. Large, coarse turnings that require special manipulation by the chemist cause unnecessary error. Turnings should be supplied that may be crumbled easily between the fingers.

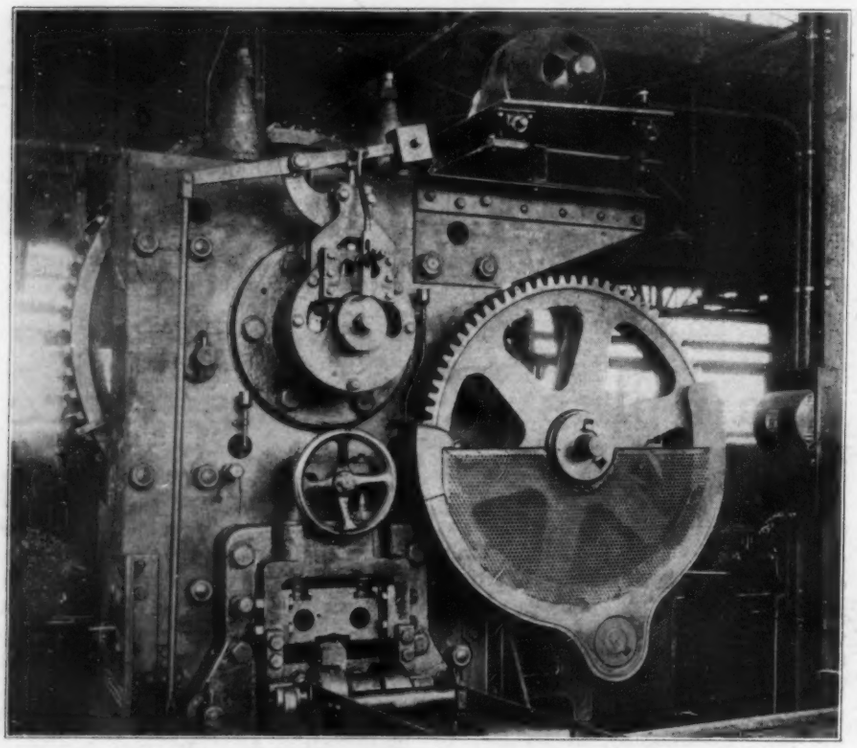
The position on the roll from which the sample is taken also is important. For example, a test made from the drillings obtained by centering the drag end introduces an error since some of the facing is sure to get into the sample, thus producing the wrong carbon result. This position on the roll sometimes is chilled, wholly or partly, which ultimately affects the quantity of carbon classed as combined. When molten iron and steel cool slowly, segregation occurs, that is the various elements such as silicon, sulphur, manganese, phosphorus, etc., are present in different proportions at various levels or depths of the casting. Since segregation means a breaking away from the average, it is seen that the analysis will vary from the center out and from the bottom to the top. Consequently, at no position may samples be obtained that will give check results in every detail. The spot where the least segregation occurs should be selected and this spot used at all times. This method gives uniform practice for all castings of the same shape and should be adhered to.

The United Engineering & Foundry Co., would prefer that the sample be taken on the bottom neck about 1 inch away from the gate in the direction of the cope end of the roll, using a flat tool 3 to 4 inches wide. The roll turner is instructed to cut the surface clean and to wait until the band is cut to approximately the proper neck diameter before gathering the sample. The tool should be jammed just enough to produce a fine cut so that at least one or two revolutions are required before sufficient sample is obtained. Care must be taken in transferring the turnings to the sample envelope for at this point much carbon may be lost by lifting the coarser particles and leaving the fine. The tool should be clean at the start and when the sample is transferred every particle should be placed in the sample container. The best method is to stop the lathe when the tool is full, although not always possible, when peaks of production are reached.

Since the quality of the roll frequently depends on the analysis, it readily may be seen that great care should be taken. True analyses not only are an aid in determining the quality, but they give the metallurgist an idea on the proper treatment of the mixtures being used. This reason alone is worth the extra time and resulting cost necessary in obtaining good samples. It is for this reason that samples should be taken from defective rolls with as much care as is exercised in good ones. It is the only real clue that the metallurgist may have to determine the cause of the trouble. Furthermore, the defective roll must be remelted and unless an analysis is made, a guess analysis must be made before mixture may be figured. This might result in the same conditions as were encountered before.

Self Starting Principle Reduces Motor Size

In the motorization of equipment, it has been estimated that 95 per cent of the constant speed applications are using motors of greater horse-power rating than necessary. The accompanying illustration shows one of the largest billet shears in the country equipped with a flywheel whose initial inertia normally would require a 75-horsepower squirrel cage motor with compensator to overcome. This machine, however, is operated by a 40-horse power self-starting motor manufactured by the Triumph Electric Co., Cincinnati. This type of motor develops a starting torque equal to about 275 per cent of the running load capacity as compared with an approximate 80 per cent torque for a squirrel cage motor.



THIS BILLET SHEAR REQUIRING ABOUT 75 HORSEPOWER TO START IS OPERATED BY A 40-HORSEPOWER MOTOR OF THE SELF-STARTING TYPE

The self-starting motor is constructed with two windings on one rotor, one a high resistance winding for developing the starting torque and the other a low resistance place winding for developing the normal running power. Although the idea of two windlings on one rotor is not new, considerable difficulty has been experienced in devising a short circuiting mechanism that would be simple and, because it must be on the rotor shaft and enclosed in the motor frame, be so rugged as to require no attention. When the self-starting motor reaches about 70 per cent of synchronous, or normal running speed, the current is transferred automatically to a phase winding, this transference being controlled and timed by an automatic switch mounted on the rotor shaft.

Up to the point of transference, about 70 per cent of synchronous speed, the phase winding is an incomplete circuit terminating in three unconnected points in the automatic switch. Facing these points but held away from them by a spring coiled around the rotor shaft is a copper ring mounted on a plate. This plate really is a centrifugal governor for from it are swung three weights. Proportionate to the acceleration of the rotor, the weights swing outward from the shaft until they force the plate against the spring, thereby bringing the ring into contact with the three points to complete the circuit of the phase winding. The unusually high starting torque is designed in the motor because so many industrial applications for electric motors are similar to the billet shear with its heavy flywheel.

Simplified Practice Is Making Progress

American industries at present are giving more serious attention to the reduction of industrial waste arising from excess variety in styles, sizes or types of manufactured commodities, says a report of the division of simplified practice to Secretary of Commerce Hoover, who established this division three years ago as an agency to co-operate in checking the tremendous drain on the nation due to waste in industry.

During the year ending June 30 there was an increasing demand for the services of the division in bringing together the producers, distributors and users of various industrial products to take joint action in eliminating the unnecessary diversity.

July 1, the report shows, was a red letter day for a number of industries. The many simplifications which became effective on that day included metal lath, reduced from 125 to 24 varieties and forged tools, in which an elimination of 46 per cent was made in types, sizes and weights. On Jan. 1 woven wire fencing was simplified from 552 styles and sizes to 69 and the package sizes cut from 2072 to 139. In builders' hardware a reduction of 71 per cent in the number of recognized finishes offered by leading manufacturers will be accompanied by a decrease of 26 per cent of the 7000 catalog items in this class, effective Jan. 1, 1925.

An excess of varieties and sizes of refractories used in steel manufacture is being surveyed for an early simplification; and similar action is planned in the case of steel lockers, now manufactured in 46 size combinations, steel reinforcing bars, warehouse forms, oil storage tanks, sheet steel, shovels, furnace parts, window sash and doors, and other items.

Initial surveys are in process, says the report, for the following industries: Automotive parts, gas water heaters, steam boilers, copper boilers, hacksaw blades, screw drivers, pocket knives, collapsible tubes, wood handles for tools, lockwashers and nut locks, drills and reamers, milling cutters, taps and dies.

Reports on Testing Wire Rope Nondestructively

A second progress report on the investigation "Nondestructive Methods for Testing Wire Rope" issued in July by the bureau of standards, Washington indicated the possibility of developing a nondestructive method of testing wire rope in service. The study of the effect of stress on the magnetic properties of steel wire has been completed and the results are briefly outlined in the report. A detailed description of the investigation and of the results has been prepared as a scientific paper. A study has also been made of the effect of wear, and the data now are being analyzed. Work in the immediate future will cover a study of the effects of corrosion and fatigue.

Unfilled Freight Car Orders Are Reduced

Chicago, Aug. 19.—Unfilled freight car orders of car builders in the Chicago and St. Louis districts approximated only 4600 cars on Aug. 15. This decided recession from the beginning of March, when Chicago district builders alone had 27,383 cars on their books is largely the result of a policy to work off business at plant capacity rather than spread it out.

In Chicago proper the American Car & Foundry Co. has 500 refrigerator cars to build for the Union Refrigerator Transit Line, the Pullman Car & Mfg. Corp. 200 flat cars for the Soo Line and the General-American Car Co., 500 automobile cars for the Missouri Pacific railroad and 500 refrigerator cars for the American Refrigerator Transit line.

At Streator Ill, the Streator Car. Co. has just begun the construction of 1000 stock cars for the Burlington railroad. The Mt. Vernon Car Mfg. Co. Mt. Vernon, Ill., has 200 box cars for the Florida East Coast railroad and 725 refrigerator cars for the American Refrigerator Transit line on its books. The American Car & Foundry Co. has 250 automobile cars for the Missouri Pacific to build at its St. Louis plant and 725 refrigerator cars for the American Refrigerator Transit line at its Madison, Ill., plant.

These 4600 cars call for approximately 46,000 tons of finished steel such as plates, shapes and bars and 40,000 tons of iron and steel, largely castings, in their trucks. The car builders have placed substantially all of this material. The large surplus of freight cars to the credit of the carriers and heavy buying earlier in the year are responsible for the present lull. The seven car building plants in Chicago proper have a monthly capacity of 4700 freight cars.

By-Products Company To Add More Ovens

Birmingham, Ala., Aug. 18.—The Alabama By-Products Corp., of which Morris Bush is president, will add a unit to its plant at Tarrant City, near here. It will be one-third the size of the present plant, and is to be finished in eight months. When the work is completed the entire plant will have a daily capacity of 1350 tons of coke or 40,500 tons monthly. The benzol output will be around 130,000 gallons monthly and other by-products will be larger. About $1,000,000 will be expended. The gas will be used for general manufacturing purposes. This is one of the most successful of the independent coke manufacturing companies in the district. Morris Bush and Horace Hammond will give their efforts toward the coke business, announcement being made that the Hammond-Byrd Iron Co. had disposed of interests in the soil pipe field and will act more as a sales agency in the future. The Alabama By-Products Corp. has a large supply of coal, mines now being operated having a tonnage which will last upwards of 30 years.

Societies News

THE program which has been prepared for presentation at the New Haven machine tool exhibit, to be held at New Haven, Conn., Sept. 15-18, includes several technical sessions, round table discussions, committee meetings, plant visitations and motion pictures of industrial processes. A number of prominent machine tool manufacturers will present papers. The exhibit will be more complete than during any previous year and will be displayed in the Mason laboratory of the Sheffield Scientific school of Yale university. The project is sponsored by the Sheffield Scientific school, the New Haven chamber of commerce and the American Society of Mechanical engineers.

The detailed program of the meetings is as follows:

Monday, Sept. 15

8:30 p. m. Opening session.

Tuesday, Sept. 16

3:30 p. m "Review of Foreign Progress in Research in Machine Shop," by C. A. Beckett.
"Discussion of Research in Machine Shop Practice in the United States," by Wilfred Lewis, B. H. Blood and others.
"Forecasting Demand for Machine Tools," by E. F. DuBrul.

8:30 p. m. "General Discussion of Education and Training for the Industries," by J. A. Smith, George B. Thomas and others.

Wednesday, Sept. 17

3:30 p. m. "Comparative Methods of Tool Design and Relation to the Quantity Production of Sheet Metal Parts," by D. M. Chason.
"Application of Ball Bearings to Machine Tools," by H. Reynolds.
"Shop Measurements," by Earle Buckingham.
"Description of New Planer," by G. E. Greenleaf.

6:30 p. m. Round table dinner meeting.

Thursday, Sept. 18

3:30 p. m. "Selling Standards to Manufacturing Organization," by E. C. Peck.
"Standardization versus Individuality," by L. D. Burlingame.
"Value of Standardization with Examples of Accomplishment," by G. T. Trundle Jr.
"Manufacturing Design of Ordnance Material," by J. D. Pederson.

6:30 p. m. Round table dinner meeting.

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Selects Fall Meeting Place

The Electric Power club will hold its fall meeting at the Greenbriar, White Sulphur Springs, W. Va., Oct. 20 to 23. The headquarters of the club are in the B. F. Keith building, Cleveland.

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Coal Problem To Be Studied

A discussion of the national's fuel supply will be the chief feature of the fall meeting of the American Chemical society to be held at Cornell university, Ithaca, N. Y., Sept. 8-13. Prof. S. W. Parr, University of Illinois, will lead a round table conference on "The Storage of Coal and Spontaneous Combustion." Secretary of Commerce Hoover's plan to relieve coal shortage and the report of the coal storage committee of the American Engineering council will be dealt with.

* * *

Electrochemists Will Meet

A round table discussion of electric furnace cast iron will be held at noon on the opening day of the annual fall meeting of he American Electrochemical association, at the Hotel Tuller, Detroit, Oct. 2-4. No papers will be read at this round table meeting, which will be entirely informal Attendance is not limited to members of the society. George K. Elliott, Cincinnati, chairman of the society's electrothermic division, will preside at the meeting. Dr. Richard Moldenke, well known consulting engineer, will open the discussion. The aim is to have at the meeting electric furnace builders, electric furnace users and prospective users, metallurgists and foundrymen.

Convention Calendar

Sept. 15-18—New Haven Machine Tool Exhibit. Annual meeting and exhibition, Mason. laboratory, Yale university, Prof. S. W. Dudley, Mason laboratory, Yale university, New Haven, Conn., is secretary.

Sept. 22-26—American Society for Steel Treating. Annual convention and exhibition, Commonwealth Pier, Boston. W. H. Eisenman, 4600 Prospect avenue, Cleveland, is secretary.

Sept. 29-Oct. 3—National Safety Council. Annual safety congress, Louisville, Ky. W. H. Cameron, 168 North Michigan avenue, Chicago, is secretary.

Sept. 30-Oct. 3—National Safety Congress. Annual meeting under auspices of National Safety council, Brown hotel, Louisville, Ky. W. H. Camerson, 168 North Michigan avenue, Chicago, is managing director.

Oct. 2-4—American Electrochemical society. Fall meeting at the Hotel Tuller, Detroit. Colin G. Fink, Columbia university, New York, is secretary.

Oct. 13-15—American Institute of Mining and Metallurgical Engineers. Annual meeting at Tutweiler hotel, Birmingham, Ala. F. F. Sharpless, 29 West Thirty-ninth street, New York, is secretary.

Oct. 13-16—American Foundrymen's association. Annual convention and exhibition, Auditorium, Milwaukee. C. E. Hoyt, 140 S. Dearborn street, Chicago, is secretary.

Oct. 16-18—American Gear Manufacturers' association. Semiannual meeting at Briarcliff Lodge, Briarcliff Manor, Westchester county, N. Y. T. W. Owen, 2443 Prospect avenue, Cleveland, is secretary.

Oct. 20-25—National Management Week. Simultaneous meetings will be held in 65 cities of the United States and Canada. Ernest Hartford, 29 West Thirty-ninth street, New York, is secretary of the committee on arrangements.

Oct. 22-24—National Association of Farm Equipment Manufacturers. Annual meeting at Congress hotel, Chicago. H. J. Sameit, 608 South Dearborn street, Chicago, is secretary.

Here and There in Industry

Live Information Which Records the Expansion of Various Lines of Productive Enterprise

CAR repair plants are being constructed by the Southern railway at Hayne, near Spartanburg, S. C. The buildings to be erected are a car repair shop of fireproof construction, 108 x 390 feet, equipped with electrically operated traveling cranes and served by five railroad tracks; an annex machine shop, 50 x 130 feet; coach shop, 180 x 240 feet; coach paint shop, 200 x 200 feet; 2-story annex for upholstery and other work, 40 x 120 feet; storehouse and office, 55 x 140 feet; wash and locker house, 35 x 105 feet; wheel shop, 55 x 105 feet; smith shop, 100 x 160 feet; planing mill, 100 x 160 feet; powerhouse, 50 x 90 feet; oil house, 25 x 40 feet; dry kiln, 20 x 40 feet; dry lumber shed 25 x 75 feet; scrap dock, 52 x 400 feet; reclaiming shop, 35 x 60 feet. Dwight P. Robinson & Co., Inc., New York, are engineers and constructors. The railroad already has entered the market for considerable machinery and tools to equip the enlarged and new shops.

* * *

ROSS-MEEHAN FOUNDRIES, Chattanooga, Tenn., manufacturer of steel castings, malleable iron, gray iron and acid resisting castings, heaters, sand dryers, heavy forges, bells, etc., is equipping its new steel foundry with a 3-ton, furnace, a 5-ton and 3-ton electric traveling crane. An annealing oven with core ovens and mold baking ovens, to be electricaly heated, also will be installed. The annealing oven is to be manufactured by the General Electric Co. The Ross-Meehan company expects the new plant to be in operation some time in December. G. F. Meehan is general manager.

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SPARTAN SAW WORKS, Springfield, Mass., manufacturer of hack saws and other equipment, has let contracts for an addition to its plant which practically doubles its available floor space. The new addition is to be ready for occupation about Nov. 1.

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A FIRST class shop fully equipped for manufacturing tools, dies, and special machinery, has been opened at 439 Forth street east, Detroit, by the "V" Tool & Die Co., recently incorporated with $10,000 capital. V. H. Franz, is president of the company, V. E. Nelson, vice president and V. B. Marshick, secretary and treasurer.

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FIREPROOF balers, of steel construction, are being manufactured by the Alsteel Mfg. Co., Battle Creek, Mich. In addition to this product the company is producing hose clamps, metal stampings, dies and jigs, etc. N. E. Conine is president; F. Z. Robbins, vice president; E. J. Allen, secretary, and J. W. Wilkins, treasurer.

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THE Enterprise Steel & Iron Co., with headquarters at 1048 First National Bank building, Chicago, has been formed by M. Fechheimer and W. L. Brown, both formerly with D. Fechheimer and previous to that with the Jos. Joseph Bros. Co., Cincinnati. The Enterprise company deals in scrap and has mill connections.

* * *

CONSTRUCTION of a 120 x 180-foot corrugated iron and concrete building is being completed for the Utility Trailer Mfg. Co., Los Angeles, which soon will move into its new plant. Fifty-two standard style trailers are manufactured by the company, from two wheel, 500-pound capacity, to 35-ton, six wheel type. Ernest Bennett is president; Walter Bennett, vice president and H. C. Bennett, secretary and treasurer.

* * *

BURKHEAD MFG. CO., Houston, Tex., has recently completed and put into operation a large plant for the manufacture of stove pipe and kindred products. The plant has a capacity of 60,000 joints of stove pipe a day. Galvanized oil cans, lard cans and other sheet metal products are manufactured also.

* * *

INCREASED capitalization from $25,000 to $35,000 will provide additional funds for increasing output of the Enterprise Boiler & Tank Works, 2306 Wabansia avenue, Chicago, fabricator of boilers, tanks and steel plate construction. A new plant is being planned. New equipment has not as yet been specified but undoubtedly will be needed when the new plant is finished. E. J. Schimke is president of the company.

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IMPROVEMENTS involving expenditure of about $100,000 are being made by the Monongahela Iron & Steel Co. at Paden City, W. Va. An 18-inch fire mill and a 10-inch guide mill are being installed for finishing products manufactured by the company. The new equipment is electrically operated and is being erected at the sheet mill end of the plant. Three large heating furnaces of the regenerative type have been installed. Fred Fagert is superintendent of the company.

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DOMINION ALLOY STEEL CO., has awarded contracts for constructing a plant about two miles south of Sarnia, Ont. Five buildings will be constructed in the first unit, having 99,730 square feet of floor space. The unit will include a sheet mill, 75 x 506 feet; a warehouse, 70 x 220 feet; a furnace building, 30 x 506 feet, a raw materials building, 45 x 507 feet, and a shearing building, 30 x 286 feet. The company has contracted to purchase a 40-ton and two 10-ton cranes. All equipment is to be installed and the plant in operation by Jan. 1, 1925.

* * *

THE Emerson Brantingham Co., Rockford, Ill., recently reopened its large No. 4 gray iron foundry for custom work. For three years the company has been making malleable castings and now are producing gray iron castings in any weight up to 10,000 pounds, having refitted its No. 4 foundry for this work, with a daily capacity of 50 tons. For its own implement work a separate gray iron foundry is maintained. Both malleable and gray iron foundries are located at Rockford.

* * *

PRACTICALLY no new equipment will be purchased for the Rhode Island Malleable Iron Works, Hillsgrove, R. I., for its foundry now being constructed. Frank D. Chase, Inc., Chicago, is designing the building which is 104x120-foot in size of concrete and steel construction. The new foundry is being constructed on the site of the plant which it replaces. The equipment from the old plant will be installed in that being built. Charles Brown is president and general manager; H. L. Steeves, first vice president; M. M. Marcus, second vice president; J. H. Dickinson, treasurer and E. E. Grinnell, secretary.

Men of Industry

Personal News of a Business Character Pertaining to the Iron and Steel and Related Fields of Enterprise

THOMAS J. ROSSITER, for many years superintendent of the American Steel & Wire Co. plant at Salem, O., has resigned. He will be succeeded by Robert C. Garrison, assistant to the superintendent at the H. P. works, Cleveland. After Mr. Rossiter recovers his health he probably will again be connected with the company.

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Verne E. Minich, president of the American Foundry Equipment Co., has sailed for a European tour.

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William W. Harman has resigned from the Akimoff Propeller Co., Philadelphia, to become connected with the Keystone Insulator Co., Pittsburgh.

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Ralph F. Miller, formerly service engineer for the United Engineering & Foundry Co., Pittsburgh, has been appointed chief engineer of the R. S. Newbold & Son Co., Norristown, Pa., founder, machinist, boilermaker, etc.

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Sam Tours, metallurgist, Doehler Die-Casting Co., has removed his headquarters from the Brooklyn plant to the foundry at Batavia, N. Y., where he will carry on and direct work as previously.

* * *

C. F. Monrose, for 15 years connected with the Carnegie Steel Co., and for the last three years in Houston, Tex., for that company has resigned to become sales manager of Country Club Estates, a real estate organization of that city.

* * *

Leo F. Caproni, of the Palmer Steel Co., Springfield, Mass., has been appointed assistant sales manager, with headquarters at the home offices. He will be in personal charge of the territory from Hartford, Conn., north to and including Vermont. He formerly represented the company, with offices at 57 Pratt street, Hartford, Conn.

* * *

Joseph D. Childers has become connected with Clayton Mark & Co., Chicago, manufacturer of wrought pipe, black and galvanized. He formerly was connected with the Illinois Steel Co., Chicago, south works, from 1909 to 1918 and later was with the Mark Mfg. Co., Steel & Tube Co. of America, and Youngstown Sheet & Tube Co., Youngstown, as Iroquois works auditor.

* * *

John B. Morton, general manager of operations for the Texas Central Power Co., Laredo, Tex., has been transferred to San Antonio, Tex. in the same capacity. Texas Central Power Co. owns and operates several extensive power properties in southwest Texas.

* * *

James C. Pinney, for seven years dean of the engineering college of Marquette university, Milwaukee, and prior to that time superintendent of bridges and public buildings for the city of Milwaukee, will retire Aug. 31 to engage in private practice. He will establish a Milwaukee office in affiliation with J. A. L. Waddell, structural engineer, New York.

* * *

Charles W. Nash, president of the Nash Motors Co., Kenosha, Wis., has announced the appointment of David M. Averill of Flint, Mich., as vice president and general manager of the new Ajax Motors Co., a Nash interest which will operate the former Mitchell motor plant in Racine, Wis. Earl D. Gunn, who has been chief engineer of the LaFayette Motors Corp., Milwaukee, will be chief engineer of the Ajax company. Mr. Averill was for 12 years assistant to Mr. Nash as president of the Durant-Dort Carriage Co. Later he had charge of production for the original Chevrolet Motor Car Co., and he is resigning as vice president and general manager of the Dort Motor Car Co. to accept the new post in the Racine organization.

Prices Shown In Nearly Normal Alignment

Chicago, Aug. 19.—The spreads between northern pig iron and heavy melting steel and between pig iron and finished steel at Chicago in July were little removed from normal, considering normal to be the average of July spreads for a number of years back.

Comparing pig iron and melting steel in this district for each July from 1910 forward, the average spread is found to be $6.50 per gross ton. Last month the spread was $4.80. Not since 1919 has the July spread been so near the average as last month's was, and in only two of these 15 years has the gap been nearer normal, excluding the fixed price year of 1918.

Northern iron and melting steel were nearest, in July in 1915 when iron averaged $13 for the month and melting steel $10.15, making the spread $2.85. In the war year of 1917, with iron at $55 and melting steel at $33.50, the margin was the greatest.

Prices Compared

No. 2 foundry iron and heavy melting steel scrap at Chicago, for month of July:

Year	Pig Iron	Melting Steel	Spread
1924	$19.80	$15.00	$ 4.80
1923	28.00	17.10	10.90
1922	24.65	15.15	9.55
1921	19.15	10.15	8.60
1920	44.40	23.70	10.70
1919	26.75	19.40	7.35
1918	33.00	29.00	4.00
1917	55.00	35.50	14.50
1916	19.00	14.15	4.85
1915	13.00	10.15	2.85
1914	14.00	9.50	4.50
1913	15.20	12.00	3.20
1912	14.60	11.75	2.95
1911	15.00	10.25	4.75
1910	16.50	12.50	4.00

No. 2 foundry iron and soft steel bars at Chicago for month of July:

Year	Pig Iron	Bars Steel	Spread
1924	$19.80	$43.00	$23.20
1923	28.00	50.00	22.00
1922	24.65	35.00	10.35
1921	19.15	45.60	25.45
1920	44.40	70.40	26.00
1919	26.75	52.40	26.65
1918	33.00	63.40	30.40
1917	55.00	90.00	35.00
1916	19.00	53.00	34.00
1915	13.00	29.20	16.20

In the pre-war years of 1910-1915 northern iron and melting steel were closer than they have been since.

Consumers of finished steel in this district have been observing frequently that finished steel has not been liquidated since the war to the extent pig iron has, yet going back 10 years the July spread was nearer normal in only three of these years than it was last month.

The quotation of pig iron on a gross ton and finished steel on a pound basis renders comparison somewhat difficult but by translating soft steel bar quotations at Chicago into net tons for this period the average spread of bars over iron from 1915 forward has been $24.83. Last month bars were $23.20 over iron. This was about 5 per cent nearer normal than the spread in July, 1923, while in July, 1922, the spread was only $10.35 or less than half of the 10-year normal. Further comparisons are given in the accompanying table.

Replogle Absorbs Warren Foundry & Pipe Co.

That 80 per cent of the stock of the Warren Foundry & Pipe Co. has been deposited under the option held by the Replogle Steel Co. for the purchase of that company's stock, is indicated by the recent application of the Replogle company to list 125,000 shares of common stock, without nominal or par value, on the New York stock exchange, and which has been approved by the board of governors. It is also indicated that the new acquisition will be partly financed by the issue of 125,000 shares and by the acquisition and sale by the Replogle company, of $2,500,000, face amount of first-mortgage bonds of the Warren company, which it is planned to consolidate with the Empire Steel & Iron Co., prior to the bond issue.

Total assets of the Warren company as of July 31, 1924, are said to have amounted to $3,802,907, and the current assets, $2,582,752, while the current liabilities amounted to $277,438. For the six months ended June 30, 1924, the company showed a net profit of $617,718, and for the year ended Dec. 31, 1923, a net profit of $776,565.

Current assets of the Replogle Steel Co. and subsidiaries, as of May 31, 1924, were $2,176,519, and current liabilities, $420,619. The operating loss of the five months ended May 31, totaled $119,862, and after providing $91,500 for depreciation, retirement and maintenance, the net loss amounted to $211,363 for the period.

M. A. Hanna Co. Has $458,376 Deficit

The M. A. Hanna Co., Cleveland, reports net earnings for the six months ended June 30, 1924, amounting to $433,416, but a deficit after depreciation, interest, federal taxes and other charges of $458,376. The consolidated income account for the first half of 1924 follow:

Net earnings	$443,416
Minority stockholders proportion	55,325
Balance for company	378,091
Depreciation	596,469
Interest	235,428
Federal taxes	4,569
*Deficit	$458,376

*Of this amount $202,300 was minority stockholders' proportion and $256,076 M. A. Hanna Co.'s proportion.

Steel Foundries Net Less

Net earnings of the American Steel Foundries, Chicago, for the first six months of 1924 totaled $2,824,215 compared with $4,197,094 in the corresponding period of last year. Surplus amounted to $2,348,664, compared with $3,459,000 for the first six months of 1923.

Wholesale Price Index Shows Advance

Washington, Aug. 19.—Although an upward trend is shown in the general wholesale prices for July, the prices of metals and metal products dropped 1.8 points in the index numbers of the United States department of labor. Declines in pig iron, steel, copper and other materials contributed to this. The department's weighted index number, which includes 404 commodities or price series, advanced to 147 for July, compared with 144.6 for June and 150.6 for July, 1923. Increases in farm products and foods chiefly were responsible for the rise in the general price level. The drop in prices of coke, gasoline and crude petroleum helped to bring down the index number of the fuel group 8.3 points.

Locomotive Earnings Less For First Half

Gross earnings of the American Locomotive Co. for the six months ended June 30 were $26,855,332, against $44,953,650 in the six months ended Dec. 31, 1923. The profit available for dividends was $2,883,185 against $5,404,440 in the preceding six months. Andrew Fletcher, president of the company, in a statement to stockholders, said the company had no loans payable as of June 30, 1924. Current assets aggregated $46,246,941, the amount being obtained after including in current liabilities reserves for United States and Canadian income and profits taxes, and reserves for shrinkage of notes listed in current assets. Unfilled orders on hand aggregated $19,524,500 on June 30, 1924, against $17,789,873 on Dec. 31, 1923. The detailed statement of earnings for the first half of 1924, compared with the last half of 1923, follows:

	Six months to June 30, 1924	Six months to Dec. 31, 1923
Gross earnings	$26,855,332	$44,953,650
Expenses and depreciation	23,514,103	38,626,250
Gross profit	$ 3,341,229	$ 6,327,400
Interest on bonds of constituent companies, etc.	23,044	42,960
Net profit	$ 3,318,185	$ 6,284,440
Deduct for United States and Canadian income taxes	435,000	880,000
Available profit	$ 2,883,185	$ 5,404,440
Dividends on preferred stock	875,000	875,000
Dividends on common stock	1,500,000	1,500,000
Surplus after dividends	$ 508,185	$ 3,029,440
Reserved for additions and betterments	.....	3,000,000
Surplus	$ 508,185	$ 29,440

Obituaries

LUTHER A. ROBY, well-known foundryman and engineer died Aug. 14 at his home, 2650 Colchester road, Cleveland. He was born in Nashua, N. H., in 1853. Here he received his early education, and was graduated from the Massachusetts Institute of Technology, Boston, and received a degree in mechanical engineering in 1875. After leaving the institute he entered the employ of the Nashua Iron Co., where he became associated with S. T. Wellman, who later removed to Cleveland and became connected with the Otis Steel Co. Mr. Roby came to Cleveland shortly afterward and entered the employ of the Otis Steel Co. as draftsman remaining 25 years during which time he rose to the position of general superintendent. He was forced to resign this position owing to ill health. Mr. Roby devoted the following 5 years to house construction work which kept him out in the open, and enabled him to regain his health. He then entered the employ of the Wellman-Seaver-Morgan Co., Cleveland. Mr. Roby first was engineer in charge of construction. When the Wellman-Seaver-Morgan Co. erected its steel foundry in Cleveland, Mr. Roby assumed charge and held that position until five years ago when he resigned owing to ill health.

* * *

Harry Edwards Kennedy, nationally known architect and designer of several of the first reinforced steel buildings, died in Philadelphia, Aug. 17, following a brief illness. Until two years ago he lived in Cincinnati.

* * *

Edwin Thomas, long identified with the iron and coal industries in the Lehigh Valley, died, Aug. 17, at his home in Catasauqua, Pa., aged 70 years. He was president of the Pioneer Mining & Mfg. Co., Birmingham, Ala., before that company was taken over by the Republic Iron & Steel Co.

Machinery Buying Spasmodic

More Active Tone and Increased Cheerfulness Noted—Railroad Activity Still Is Limited and Industrial Demand Scattered—Used Equipment Inquiries Increased—Crane Awards Few—Summer Dullness Still Prevails

SPASMODIC purchases by several large interests lend a more active tone to the machine tool market, but general buying has not increased to any appreciable extent. Sentiment continues to become more cheerful, many believing that after the usual summer dullness business will recover to a more normal level and that machine tool demand will share in this betterment.

Railroad activity is limited to purchases of a few large machines, the Santa Fe, Lehigh Valley, Nickel Plate and others closing on requirements. The Lehigh Valley is the most active of the railroads in the market, figuring on 15 to 18 machines. This road recently closed on nine radial drills and engine lathes with an eastern builder.

Industrial demand is scattered with the largest business being that of Mitsui & Co., New York, buying for the Shibaura Engineering Co., Japan. These purchases are reported as approximating $250,000. The Chicago board of education is closing bids on a large number of tools. Definite statements that the board intends to close quickly to the lowest bidder has added interest to this business, the preceding bids being rejected because of an award to other than the low bidder.

Used equipment is not showing more activity, despite increased inquiries and more shoppers. Price competition among dealers is keen and much of the business done is not profitable to the sellers. Trading among dealers comprises a good share of going business.

Crane awards are few, the largest of the week being four 25-ton electric cranes for the Interboro Rapid Transit Co., New York. Such inquiries as the Bethlehem Steel Co. has in the market show no indication of prompt action.

Large Users of Equipment Remain Out of Market

NEW YORK, Aug. 19.—Further purchases by Mitsui & Co., 65 Broadway, for the Shibaura Engineering Co., Japan, feature the local machine tool market. These purchases are said to conclude the list which has involved an expenditure of approximately $250,000. Many of the items originally contemplated were lopped off as negotiations were brought to a head. A number of machines were reported to have been supplied from surplus stocks of the General Electric Co.

Domestic trading continues slack, with the list of the Lehigh Valley among the relatively few active propositions. With the addition of five machines just inquired for, and including two of a heavy type, the Lehigh Valley is probably figuring at present on 15 or 18 machines. Recently that railroad closed on nine radial drills and engine lathes to an eastern seller.

Recent scattered orders involve two axle lathes for the Atchison, Topeka & Santa Fe railroad, a 6-foot radial drill for the Ingersoll-Rand Co., New York, and a 12-foot bending roll for the Oil Well Supply Co., Pittsburgh. The Newfoundland government railroad, Nova Scotia, is inquiring for welding equipment and Citroen, a French automobile manufacturer, is reported to be negotiating through his local representative, for several machines.

The American Manganese Steel Co., Los Angeles, the Ford Motor Co., Detroit, and the Milwaukee Manual Training school, have been recent buyers of electric furnaces, placing their business with the Pittsburgh Electric Furnace Corp. Although crane buying still is restricted, both orders and inquiries are coming through in better volume. The outstanding overhead crane award of the past week, involves four 25-ton electric cranes for the Interboro Rapid Transit Co., this city. Particular improvement is noticeable in hoists and derricks.

Summer Dullness Continues

CLEVELAND, Aug. 19.—Despite some good sales reported by a few dealers and manufacturers, summer dullness continues in the machine tool market and buying still is restricted. A generally better sentiment is evident, but this is not resulting in increased sales. One manufacturer reported the best bulk of business for any week since early spring. This interest closed on several machines to an automotive manufacturer in Detroit, and also with a western railroad for repair shops. This is the first western railroad business to come into this territory in several months. Westinghouse Electric & Mfg. Co., again took several tools for it automatic signal division at Wilmerding, Pa. A Youngstown steel company purchased a large machine for expansion in one of its western plants.

Inquiries are good, but come mostly from price seekers. There are many buyers close to the market and these are awaiting merely a slight quickening in business before closing on requirements.

Used equipment demand is slightly better. Inquiries are more numerous and shoppers' interest is maintained. Haggling over price contributes weakness to an otherwise firming market. Small machines continue to comprise the bulk of going business although one dealer closed out a large punch press and motor and another large radial drill.

Crane builders are receiving a fair amount of inquiry but orders have fallen to practically nothing.

Tool Dealers Hopeful

BOSTON, Aug. 19.—The New England textile industry continues to show improvement and with it is the hope of improved machine tool sales. As yet little direct reflection of the textile activity is apparent in the machine tool market, however. Textile machinery manufacturers are increasing production along moderate lines with several good sized orders recently entered. Machine tool sales in Boston during the past week have been widely scattered. One manufacturer equipping a new machine shop bought tools aggregating about $10,000. Dealers report a total of 12 to 14 used tools placed during the week. Prices of both used and new equipment are unchanged.

Inactivity More Pronounced

PITTSBURGH, Aug. 19.—While the sale of used machine tools off the floor of the Pittsburgh Model Engine Co. which now is in the process of liquidation, doubtlessly is hurting district sales, a little buying still is being done. Approximately 50 tools of this company were sold during the week just

closed at prices considered bargains. The turn-over of machine tools by dealers was comparatively small the past week but some trading is noted. District offices of some of the large machine tool builders have witnessed no upturn in conditions. Inquiry for all types of machine shop equipment is scant and immediate business still is confined to odds and ends. There is some indication that certain railroads plan to step into the market within a few weeks.

The crane market is surrounded with dullness, with but one inquiry found in trade circles this week. This involves a 25-ton crane with 10-ton auxiliary for installation outside the district. The 10-ton ore bridge desired by the Carnegie Steel Co. for its Carrie furnaces is expected to be closed relatively soon. Commissioners of Allegheny county bought two used locomotive cranes for asphalt plants being erected in this district. A contracting firm outside this district purchased a 30-ton locomotive crane, the deal having been closed by a representative in the Pittsburgh district.

More School Board Tools Out

CHICAGO, Aug. 19.—By Aug. 26 the board of education will have taken new bids on all of the equipment it plans to buy at this time for its technical high schools and following its experience with the first set of bids the board has declared its intentions of closing promptly and accepting the lowest bid. The board closes Aug. 26, for Crane school, for four power saws, six 10½-inch sensitive bench drills, one disk grinder with 12-inch disks, three 14-inch plane crank shapers, four milling machines 28 x 10 x 16 inches wide automatic feeds, six 20 x 1½-inch wet tool grinders, two 23-inch sliding head drills, one ½-inch and one ¾-inch drilling machines, four 3-spindle high speed ball bearing drills, seven 11-inch x 4-foot motor driven head stock speed lathes, two special combination and two high speed furnaces, three cutters and tool grinders, four single spindle centering machines and 30 cast iron vise stands.

On Aug. 26 the board also will take bids on two high speed sensitive bench drills and one draw-in attachment for a 14-inch geared head lathe for the Carl Schurz school and the following equipment for the Tilden school wood shop: 30 motor head speed lathes 24 inches between centers and two 12-inch x 48-inch between centers, one mortising machine, two 6-inch portable hand planers and jointers, four oil stone tool grinders and one 20-inch hand planer and jointer. Bids will be closed Aug. 26 on motor drive parts for a number of shapers, lathes, planers and radial drills already installed. Bids will be opened Aug. 26 on two milling machines 28 x 10 x 18-inches with power feeds, two 12-inch and two 14-inch crank shapers, three 20-inch tool grinders, two drill presses and one centering machine for the Tilden school. Bids closed Aug. 19 on three motor head lathes for the Phillips school, one centering machine and one screw cutting lathe for Crane school, 11 14-inch x 5-foot geared head engine lathes for the Nicholas Senn school and four of the same type for the Carl Schurz school. This equipment all is motor driven.

Both new and used machinery houses have experienced improved demand in the past few days. One house has had a good run on used lathes, shapers, planers, drill presses and milling machines, but reports a decided falling off in demand for punch presses. A Chicago company is in the market for one 28 to 30-inch metal shaper and five woodworking tools. A Chicago interest is inquiring for several lathes for maintenance work, while another is seeking several production lathes. The tone of the machinery market generally is more encouraging.

Sloss-Sheffield Co., Birmingham recently awarded the Link-Belt Co. an order for a gondola car dumper. This dumper will be similar to that installed at the Cahokia power station, East St. Louis. The new machine will be required to dump gondola cars of coal, 100 tons capacity at the rate of twenty an hour.

Orders Continue Light

CINCINNATI, Aug. 19.—Machine tool orders continue to be placed in this market at about the same rate as prevailed last week. Sales still are confined to a small number of tools, large orders being the exception. Manufacturers report a larger volume of inquiries from the railroads and several lists representing a sizable volume of tools are before the trade. Automobile manufacturers are showing more interest, orders having been placed here for several lathes, grinders and boring mills during the past week. One seller reported the sale of a large boring mill to a shipbuilding company in the East. In the used machinery market a falling off in inquiries is reported with sales of small consequence. Not much change in existing conditions is expected before next month.

Crane Awards and Inquiries of the Week

Orders Placed

Four 25-ton electric cranes, 66-foot span, for the Interboro Rapid Transit Co., New York, to an eastern builder.

Two 100-ton crane bridges for the Pennsylvania railroad, to an eastern builder.

Two 10-ton cranes and one 40-ton crane for the Dominion Alloy Steel Co., to an unnamed interest.

One overhead crane for a power plant in Rome, N. Y., to the Whiting Corp.

Single Installations

160-ton wrecking crane for the Big Four railroad, to Industrial Works.

30-ton, handpower, overhead crane for Southern Sierras Power Co., and one 20-ton, handpower for the same company to Cyclops Iron Works.

25-ton locomotive crane, also several hoists and derricks, for a hydro-electric plant at Columbus, Ga., placed through Stone & Webster, engineers, with the American Hoist & Derrick Co.

15-ton used locomotive crane, for Callahan & Ottomann, Mamaroneck, N. Y., to the Hoisting Machinery Co., 50 Church street, New York.

10-ton electric crane, 77-foot, 7-inch span, for the Lukens Steel Co., for installation at New Orleans, to the Shepard Electric Crane & Hoist Co.

10-ton locomotive creeper type crane for Nevada highway commission, Reno, Nev., to Northwest Engineering Co.

10-ton locomotive creeper type crane for Union Paving Co., San Francisco, to Northwest Engineering Co.

7½-ton electric crane, 44-foot span, for the Smith & Winchester Foundry, South Windham, Conn., through the Aberthaw Co., Boston, to the Northern Engineering Works.

7½-ton traveling crane for Union Works, Los Angeles, to Shepard Electric Crane & Hoist Co.

5-ton traveling bridge crane for Union Lumber Co., Fort Bragg, Cal., to Cyclops Iron Works.

5-ton, single I-beam crane, 31-foot 6-inch span, for the Trenton Malleable Iron Co., Trenton, N. J., to the Shepard Electric Crane & Hoist Co.

4-ton hammerhead crane for the Henry Miller Timber Co., Tacoma, Wash., to Star Iron & Steel Co.

4-ton hammerhead crane for Victoria Lumber & Mfg. Co., Chemainus, B. C., to Star Iron & Steel Co.

3-ton I-beam crane for California National Supply Co., Taft, Cal., to Cyclops Iron Works.

3-ton, electric crane, 27-foot 4½-inch span, for the Boynton Furnace Co., Jersey City, N. J., to the Shepard Electric Crane & Hoist Co.

¾-yard bucket gasoline shovel for Irey & Holder, Lodi, Cal., to Northwest Engineering Co.

Ditcher for the Erie railroad, to the American Hoist & Derrick Co.

Orders Pending

20-ton crane for the Standard Oil Co. of New Jersey, for installation at its Eagle Works, Jersey City, N. J., still pending.

Electric overhead crane and a 20-ton locomotive crane for a power plant for the Luzerne County Gas & Electric Corp., Hunlock, Pa.; bids asked through Stone & Webster, Boston, consulting engineers.

Construction and Enterprise

Concise and Timely Business Building Opportunities from the Field of Industry

MOBILE, ALA.—Phoenix Machine Co., recently incorporated has obtained a site on Madison street, where it will construct buildings. V. P. McCoy is president. *Noted July* 31.

RUSSELLVILLE, ARK.—Just-Right Dump Body Mfg. Co. has been formed to build automobile bodies and install bodies and parts, etc., with A. C. Dollar as president and L. J. Wheeler as secretary.

LONG BEACH, CAL.—The Pacific Steel Mfg. Co. will construct mills and buildings here. Its own structural department will do the fabricating and erecting. The Merrit-Scott-Chapman Salvaging & Wrecking Co. will do the dredging. J. C. Schindler is chief engineer for the Pacific company.

LOS ANGELES—G. M. Duntley, Kerchoff building, plans 1-story, 125x150-foot garage on San Pedro street.

LOS ANGELES—Thompson Mfg. Co., 2251 East Seventh street, manufacturer of lawn, field and orchard sprinklers, has added another unit to its plant. W. Van E. Thompson is president and general manager of the company.

LOS ANGELES—Scofield Engineering-Construction Co. has been awarded contracts by the Western Improvement Co. for erecting a $500,000 warehouse at Industrial and Mateo streets. The building will be 140x259 feet, of reinforced concrete.

MODESTO, CAL.—Borden Condensed milk Products Co., Kansas avenue, plans 1-story 50x180-foot can manufacturing plant. Davis-Heller-Pearce Co., Dalta building, Stockton, Cal., are architects.

ORANGE, CAL.—California Wire Co. plans constructing a plant for production of insulated wire cables.

SAN FRANCISCO—Jewell Steel & Malleable Co., 1315 Potrero avenue, has awarded contracts for constructing 1-story plant addition.

BANTAM, CONN.—Trumbull-Vanderpoel Electric Mfg. Co. has awarded contracts for constructing a 2-story plant addition.

EAST HARTFORD, CONN.—O. B. Herlth Co., 272 Holland street, plans building a 1-story addition to its machinery plant.

HAMPDEN, CONN.—Architectural engineers will be appointed shortly by the United Smelting & Aluminum Co., for the rebuilding of its plant which recently was damaged by fire.

NEW BRITAIN, CONN.—State board of education is taking bids on a 1-story, 40x40-foot boilerhouse, for which W. E. Brooks, Gold and Lewis streets, Hartford, Conn., is architect. Alfred Kellogg, 78 Franklin street, Boston, is engineer.

NEW HAVEN, CONN.—Pierce, Caroll & Co., 177 Church street, is in the market for a heavy duty engine lathe, crank geared shaper, and other tools.

NEW LONDON, CONN.—E. C. Ford, Norwich, Conn., plans 2-story, 61x110 foot brick and steel garage costing about $40,000.

WATERBURY, CONN.—Bids will be asked shortly by Platt Bros. & Co., manufacturers of metal strippings on the erection of a 2-story plant addition, 120x125 feet. Fred Webster, 51 West Main street, is architect.

WATERBURY, CONN.—Plume & Atwood Mfg. Co., 470 Bank street, has let general contract to the Torrington Building Co., 182 Church street, Torrington, Conn., to build a 5-story, 50x150-foot brick plant addition costing about $80,000. Westcott & Mapes, 139 Orange street, is architect. *Noted July* 31.

Where additional information is presented, reference is made to date of issue in which previous item appeared.

DAYTONIA BEACH, FLA.—Harton Motor Co. has been incorporated for $25,000 to own and operate a garage, service station and sales room, by V. V. Harton, and George F. Mansfield.

JACKSONVILLE, FLA.—Florida Steel & Wire Co. plans construction of additional units for manufacture of wire nails. John G. Palmer, Professional building, is general manager. The company recently was incorporated.

MIAMI, FLA.—Robbins Roofing Works, Inc., 1350 Northeast First street, has been incorporated for $100,000 by W. R. Robbins, 1027 Southwest seventh street, as president.

MIAMI, FLA.—Airkool Spark Plug Co. has started constructing a plant at Twenty-ninth street near Second avenue to have an initial annual capacity of 10,000,000 plugs. J. B. Harper is president. *Noted July* 24.

ST. PETERSBURG, FLA.—Automotive Sales Co., 125 Second street, has awarded contracts for constructing additions and remodeling present shops.

AURORA, ILL.—S. S. Mfg. Co., 366 River street, has been incorporated for $10,000 to manufacture and deal in pumps and other machinery used for pumping, by H. W. Schuler, Roy J. Solfisburg and Fern Cliggitt, with Sears & Solfisburg, as attorneys.

CHICAGO—James Picone, 333 Sherman avenue, plans 1-story, 104x118-foot garage costing about $35,000. J. T. Fortin, 600 Blue Island avenue, is architect.

CHICAGO—A. F. Anderson Iron Works, 5844 Loomis street, is taking bids for a 2-story warehouse through Ralph C. Harris, 190 North state street, architect.

CHICAGO—Plans are being drawn for a 1 and 2-story garage and service station for the Red Cab & Motor Co., 53 West Jackson boulevard, care of Charles F. Heinig, that address.

CHICAGO—Contracts have been let for a 1-story, 94x125-foot garage for G. H. Glinke, 8140 South Green avenue. A. F. Hughes, 11100 South Michigan avenue, is architect.

CHICAGO—B. Boshes, 1608 South Central Park avenue, plans 1-story, 130x150-foot garage costing about $75,000. Joseph H. Klafter, 127 North Dearborn street, is architect.

CHICAGO—C. Matlin, 1208 South Troy street, plans constructing 1-story, 50x150-foot garage costing about $75,000. Joseph H. Klafter, 127 North Dearborn street, is architect.

CHICAGO—Clayton Mark & Co., 111 West Washington street, manufacturer of wrought pipe, etc., has awarded contracts to the Austin Co. for a 90x120-foot building, requiring approximately 100 tons of steel. The plant is to be located at Seventy-fourth and Robey streets and is to be completed within 45 days.

CHICAGO—Charles Schoen has awarded general contract to Olaf Hansen, 3966 Avondale street, for 1-story, 75x180-foot brick garage on Cicero avenue near Cornelia street. C. W. Lampe, 155 North Clark street, is architect.

CHICAGO—Cornish Knowles Radio Co., 16 South Wells street, has been incorporated for $50,000 to manufacture and deal in raido equipment, by Daniel E. Knowles, John D. Clancy and Lorenzo D. Cornish.

CHICAGO—E. Toman & Co., 2621 West Twenty-first place, have been incorporated for $25,000 to manufacture and deal in phonographs and radio equipment, by Edward Toman, Michael Toman and John Koranek.

CHICAGO—The Service Battery & Tire Works, 6158 South Kedzie avenue, has been incorporated for $5000 to operate garages, automotive service stations, repair shops, etc., by Kathryn Hill, C. W. Hill and William Hill.

CHICAGO—American Oven & Machine Co., 111 West Washington street, Felix J. Katz, president, has retained Richard Griesser, 64 West Randolph street, as architect for a 1-story, 125x225-foot plant of brick and stone construction, at California and Flourney streets.

CHICAGO—Appleton Train Control Co., 108 South La Salle street, has been formed with $20,000 capital, by Russell V. Appleton, Arch Welty, Arthur Welty and William B. Ratner. The company will manufacture and deal in train control apparatus.

CHICAGO—E. F. Houghton & Co., Philadelphia, manufacturer of oils, leathers, beltings, etc., has awarded the Austin Co., Cleveland, engineer and builder, a contract for additions to its local plant. A 2-story, 85x100-foot mill-type building will be constructed.

CHICAGO—Federal Retinning Co., 120 North Dearborn street, has been incorporated with 75 shares no par value stock, to design, manufacture and construct commodities of tin, tin metal, sheet metal, etc., by Monti Hicks, Alexander Haritonger and others. Julius Savitky, 127 North Dearborn street, is representative.

DECATUR, ILL.—Illinois Power & Light Co. has awarded general contract to L. G. Baker & Bros., 1026 West Macon street, for constructing 1-story, 80x500-foot garage and repair shop, costing about $30,000. Brooks, Bramhall & Dague, New National Bank building, are architects.

JACKSONVILLE, ILL.—Success Road Machine Co., 800 Case avenue, has been incorporated for $12,000 to manufacture and deal in road machines and other equipment, by Lee A. Sullivan, W. E. Sullivan, John Snyder and Lee Roy Craig.

WARSAW, ILL.—Ozonised Ox Marrow Co. plans purchase of an 18-inch high duty engine lathe, butt welder, and shaper.

INDIANAPOLIS—Indianapolis Candy Co., 255 East Maryland street, Charles Schimmell, president, has retained Russell N. Edwards, 45 Union Trust building, as architect for a 4-story, 85x100-foot plant containing powerhouse, engine room, etc.

INDIANAPOLIS—The Schwimmer Engineering & Mfg. Co. has been incorporated for $100,-

000 to manufacture heating, cooking and roasting machines, by Henry W. Schwimmer, Irvin C. Stevenson, Edward O. Hind, Frank E. Worley and Elmer P. Warren.

BELLEVUE, IOWA—H. D. Johnson Piano Co., H. D. Johnson, president, plans reconstructing plant recently damaged by fire.

PARSONS, KANS.—A machine and pattern shop probably will be located here shortly according to the industrial committee of the local chamber of commerce.

CUMBERLAND, MD.—The American Cellulose & Chemical Mfg. Co., has awarded the Austin Co., Cleveland and Philadelphia, engineer and builder, contract for erecting an acetone manufacturing building. C. F. Beran is chief engineer of the American company.

CHELSEA, MASS.—Forbes Lithograph Mfg. Co., has retained Monks & Johnson, 99 Chauncey street, Boston, as architects for a 1-story engine room and powerhouse.

WESTFIELD, MASS.—American Abrasive Co., H. E. Wilcutt, treasurer, has postponed action until this fall on constructing a manufacturing plant addition.

WILLIMANSETT, MASS.—B. N. Perkins is taking bids through Lockwood, Greene & Co., 24 Federal street, Boston, architect, for 1-story, 158x181-foot machine shop of reinforced concrete and steel and brick construction.

WORCESTER, MASS.—The Edinburg Metal Co., 1031 Slater building, is reported as being in the market for an electric hoist and derrick.

CARO, MICH.—Great Lakes Power Co. is wrecking its water power plant on the Cass river and will construct a new penstock and plant. Extension of lines and other expansion are planned.

DETROIT—Newcomb-David Co. has been incorporated for $150,000 to manufacture and deal in metal goods and supplies, by Cyrus B. Newcomb, 226 Prospect avenue, northeast, Grand Rapids, Mich.; William A. David, Highland Park, and Lawrence A. Braun.

DETROIT—Detroit Dishwasher Co., 1562 Twelfth street, has been incorporated for $30,000 to manufacture, sell and deal in dishwashing machines and other articles, by Redge Harvey, 3231 Virginia street, Don O. Wilson and A. P. Washlake.

DETROIT—Kenneth Anderson Co., 133 Atwater street east, has been incorporated for $100,000 to manufacture and deal in iron pipe, fittings, steam supplies, etc., by Kenneth Anderson, Nellie I. McVittie and Norman D. Anderson of Pontiac.

DETROIT—Detroit Gray Iron Foundry Co., Wight & Iron streets, has retained Mildrier & Eisen, 924 Hammond building, as architects for constructing 1-story, 50x80-foot brick reinforced concrete and steel foundry addition. Harry H. Wyatt is secretary.

FENTON, MICH.—Fenton Machine Tool & Die Co. contemplates constructing 1-story, 90x160-foot plant of brick and steel. A. W. Westman is president and general manager. *Noted July 24.*

FLAT ROCK, MICH.—Henry Pentill has the general contract for constructing 1-story, 60x140-foot garage of brick and steel and concrete. John Kasurin, 502 Empire building, Detroit, is architect.

FLINT, MICH.—Flint Malleable Castings Co., 318 Dayton building, is taking bids on a 1-story, 36x44-foot foundry of brick. Wright & Nice, Kearsley and Smith streets, are architects.

GRAND RAPIDS, MICH.—Burton Bronze Co. has been formed with $25,000 capital, to manufacture nonferrous metals and castings, by

Warehouse Steel Prices

Quotations at Cents Per Pound at Leading Market Centers

STEEL BARS

Boston	3.265c
Buffalo	3.30c
Chicago	3.00c
Cincinnati	3.30c
Cleveland	3.11c
Detroit	3.15c
Los Angeles	3.25c
New York	3.24c
Philadelphia	3.10c
Pittsburgh	2.90c
San Francisco	3.75c
Seattle	3.25c
St. Louis	3.15c
St. Paul	3.25c

IRON BARS

Boston	3.265c
Buffalo	3.35c
Chicago	3.00c
Cincinnati	3.30c
Detroit	3.15c
New York	3.24c
Philadelphia	3.10c
St. Louis	3.15c

REINFORCING BARS

Boston	3.25c to 3.50c
Buffalo	3.40c
Chicago	2.25c to 2.35c
Cincinnati	3.30c
Cleveland	2.66c to 3.21c
Detroit	3.15c
Los Angeles, C. L.	3.60c
Los Angeles, L. C. L.	4.00c
New York	2.80c
Philadelphia	2.30c
Pittsburgh	2.90c
San Francisco, C. L.	3.65c
San Fraxcisco, L. C. L.	4.00c
Seattle	3.50c

STANDARD STRUCTURAL SHAPES

Boston	3.365c
Buffalo	3.40c
Chicago	3.10c
Cincinnati	3.40c
Cleveland	3.21c
Detroit	3.25c
Los Angeles	3.75c
New York	3.34c
Philadelphia	3.10c
Pittsburgh	3.00c
San Francisco	3.60c
Seattle	3.25c
St. Louis	3.25c
St. Laul	3.35c

PLATES

Boston	3.365c
Buffalo	3.40c
Chicago	3.10c
Cincinnati	3.40c
Cleveland, ¼-inch and thicker	3.21c
Cleveland, 3/16-inch	3.435c
Detroit	3.25c
Detroit, 3/16-inch	3.45c
Los Angeles	3.25c
New York	3.34c
Philadelphia	3.30c
Philadelphia, 3/16-inch	3.30c
Pittsburgh	3.00c
San Francisco	3.25c
Seattle	3.25c
St. Louis	3.25c
St. Paul	3.35c

NO. 10 BLUE ANNEALED SHEETS

Boston, 3/16-inch	4.165c
Buffalo	4.05c
Chicago	3.80c
Cincinnati	3.90c
Cleveland	3.45c to 3.76c
Detroit	3.95c
Los Angeles	4.15c
New York	3.89c
Philadelphia	3.75c
San Francisco	4.75c
Seattle	4.50c
St. Louis	3.90c
St. Paul	4.05c

NO. 28 BLACK SHEETS

Boston	5.00c
Buffalo	4.75c
Chicago	4.60c
Cincinnati	4.55c
Cleveland	4.35c to 4.55c
Detroit	4.65c
Los Angeles	5.25c
New York	4.60c
Philadelphia	4.75c
San Francisco	5.55c
Seattle	5.50c
St. Louis	4.65c
St. Paul	4.85c

NO. 28 GALVANIZED SHEETS

Boston	6.00c
Buffalo	5.85c
Chicago	5.50c
Cincinnati	5.65c
Cleveland	5.45c to 5.65c
Detroit	5.75c
Los Angeles	6.15c
New York	5.60c
Philadelphia	5.85c
San Francisco	6.25c
Seattle	6.50c
St. Louis	5.65c
St. Paul	5.65c to 5.90c

BANDS

Boston	4.015c
Buffalo	4.05c
Chicago	3.65c
Cincinnati	3.95c
Cleveland	3.86c
Detroit	3.80c
Los Angeles	4.00c
New York	3.99c
Philadelphia	3.85c
Pittsburgh	3.60c
San Francisco	4.50c
Seattle	4.25c
St. Paul	3.90c

HOOPS

Boston	5.50c
Buffalo	4.40c
Chicago	4.15c
Cleveland, 1-inch and wider No. 20 and heavier	3.86c
Cleveland, narrower than 1-inch	4.36c
Detroit	4.30c
New York	4.49c
Philadelphia, ¾-inch and wider, 20 gage and heavier	4.10c
Philadelphia—narrower than ¾-inch	4.60c
Pittsburgh	3.60c
Seattle	5.00c
St. Paul	4.70c

COLD FINISHED STEEL

Boston (rounds)	4.15c
Boston (shapes)	4.65c
Buffalo (rounds)	4.20c
Buffalo (shapes)	4.70c
Chicago (shapes)	4.30c
Chicago (rounds)	3.80c
Cincinnati (rounds)	4.05c
Cincinnati (shapes)	4.55c
Cleveland (rounds)	4.00c
Cleveland (shapes)	4.50c
Detroit (rounds)	4.10c
Detroit (shapes)	4.60c
Los Angeles (rounds)	5.25c
New York (rounds)	4.15c
New York (shapes)	4.65c
Philadelphia (rounds)	4.15c
Philadelphia (shapes)	4.65c
Pittsburgh (rounds)	3.80c
Pittsburgh (sq. hex. and flats)	4.30c
San Francisco (rounds)	5.50c
Seattle (rounds)	5.00c
St. Paul (rounds)	4.05c

WELDED PIPE

Discounts from warehouse, New York City

Standard Steel Pipe
(Subject to Shading)

	Black	Galvanized
⅛-⅜-inch butt	—31	+ 2
½-inch butt	—41	—24
¾-inch butt	—46	—32
1/3-inch butt	—48	—34
3½-inch lap	—44	—30
7-8-inch lap	—41	—11
9-10-inch lap	—35	— 8
11-12-inch lap	—34	— 6

Wrought Iron Pipe

	Black	Galvanized
⅛-⅜-inch butt	+44	+78
½-inch butt	— 4	+19
¾-inch butt	—11	+ 9
1-1½-inch butt	—14	+ 6
2-inch lap	— 5	+14
3-6-inch lap	—11	+ 6
7-12-inch lap	— 3	+16

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If you are not receiving our Stock-list we shall be glad to send it to you regularly upon request.

Upson Works

Open Hearth Steel Bars for Special uses. Also a complete line of Bolts and Nuts. Prompt Shipments.

THE
BOURNE-FULLER CO.
Iron, Steel
Pig Iron
Coke
CLEVELAND

New York **Chicago**
San Francisco
Cincinnati **Detroit**

B. T. Moore, room 514, 110 South Dearborn street, Chicago; W. H. Lindae, and George Peters of Grand Rapids.

LUVERNE, MINN.—City of Luverne, D. W. Campbell, clerk, has awarded contracts to the Commonwealth Electric Co., 417 Broadway, St. Paul, for constructing power plant addition.

FORT MURRAY, N. J.—National Fireproofing Co., Nathan Park, manager, has plans for constructing a plant.

JERSEY CITY, N. J.—C. H. Ziegler, 75 Montgomery street, is architect for a 1-story, 50x100-foot brick and steel foundry at 53 Fairmount avenue for Charles Mundt & Son.

PATERSON, N. J.—Atlantic Warehouses, Inc., Atlantic & Pacific Tea Co., have awarded general contract to Turner Construction Co., 244 Madison avenue, New York, for 4-story, 100x200-foot warehouse. W. B. Van Irwegern, is engineer. D. Smith, Bay street, Jersey City, is purchasing agent for the Atlantic company.

ROCKAWAY, N. J.—The North Jersey Ore & Concentrating Co. has taken over the local plant and properties of the North Jersey Steel Co., including the Beach Glen iron ore mine. Extensions and betterments to increase plant capacity, are planned.

RUTHERFORD, N. J.—The Anaconda Copper Mining Co., 25 Broadway, New York, has awarded contracts to Walter Kidde Co, 90 West street, New York, for erecting 1-story plant here, 80x260 feet.

BINGHAMPTON, N. Y.—City board of contract and supply, O. J. Pickering, city hall, is taking bids on the first unit of a power house.

BRONX, N. Y.—Henry Bruckner, president, borough of Bronx has awarded contract to Balaban & Gordon Co., Inc., 116 West Thirty-ninth street, for 1-story, 80x210-foot garage of brick. Max Hausle, 3307 Third avenue is architect.

BROOKLYN, N. Y.—Benjamin Driesler, 153 Remsen street, is architect for a 1-story, 13x100x200-foot garage, for J. C. Cochran, St. Paul's street.

BROOKLYN, N. Y.—Thomas P. Graham, 160 Broadway, has plans for constructing 2-story, 14x28x190-foot garage, at 770 Lefferts avenue. E. P. Doyle, 11 John street, New York, is architect.

BROOKLYN, N. Y.—City Roofing & Sheet Metal Corp. has been incorporated for $5000 by D. W. and S. Israel, and F. L. Garfunkel, with Levy, Gutman & Goldberg, 277 Broadway, as attorneys.

BROOKLYN, N. Y.—Dalton Tool Corp. has been incorporated with 2000 shares $50 par preferred and 2000 shares no par value common stock, by H. A. Mossler, M. V. Arington, and L. P. Eisner, with A. Litchtig, 141 Broadway, as attorney.

BUFFALO, N. Y.—C. R. Ingersoll & Co. has been incorporated for $15,000 to build machinery, by C. R. Ingersoll, L. Leff, and W. R. Daniels, attorney.

BUFFALO, N. Y.—The Worthington Pump & Machinery Corp., 115 Broadway, New York, has awarded the Austin Co., Cleveland, engineer and builder, contract for a new unit of its local plant. A pattern storage builing, 80x200 feet, 2-story, steel construction, is planned.

DEPEW, N. Y.—Depew & Lancaster Light, Power & Conduit Co., 177 Central avenue, Lancaster, N. Y., has let general contract to Crooker & Carpenter, Crosby building, Buffalo, for a 2-story, 38x48-foot warehouse of brick and steel. Bley & Lyman, 250 Delaware avenue, Buffalo, are architects.

ITHACA, N. Y.—Pritchard & Son, 106 West Green street, is taking bids on 1-story, 60x185-foot garage and service station. John M. Wilgus, 202 Court street, is architect.

LONG ISLAND CITY, N. Y.—American Stove Co., 209 West Forty-third street, New York, has awarded the White Construction Co. general contract for 5-story reinforced concrete building at 3012 Skillman place.

LOWVILLE, N. Y.—Portable Fire Escape Co. has been organized with $200,000 capital to manufacture fire escapes and other articles, by J. and I. Tock and J. Laszio, with M. B. Moran, as attorney.

NEW YORK—Max Shar, Abe Greenberg and David Bogove, 84 Forty-first street, Corona, N. Y., and 432 East 108th street, New York, have retained Paul Lubroth, 246 East 199th street, for 1-story, 45x100-foot garage.

NEW YORK—Porter Hardware Corp. has been incorporated for $35,000 to manufacture and deal in hardware and tools by A. Lembark, B. B. Gottlieb and D. Samuelsohn, with Bijur & Herts, 29 Broadway, as attorneys.

NEW YORK—Ginnette Safety Blade Corp. has been incorporated for $50,000 to manufacture and deal in safety razor blades, etc., by M. Balalar, and A. Sekuler, with A. S. Friends, 36 West Forty-fourth street, as attorneys.

NEW YORK—Economy Steel & Tool Co. has been incorporated for $20,000 by V. A. Roberts, M. I. St. John, and L. A. Anderson, with Morrell, Bates, Topping & Anderson, 27 Cedar street, as attorneys.

NEW YORK—Charles E. Clopp, 1140 Fifth avenue, has retained Maximilian Zipkes, 25 West Forty-third street, as architect for designing 5-story, 100x125-foot garage costing about $50,000.

NEW YORK—Steel Bound Platform Corp. has been formed with $20,000 capital, to manufacture and deal in metal warehouse platforms, etc., by B. L. Blankstein, L. Berlin and F. Greissman, with S. G. Geller, 277 Broadway, as attorney.

NEW YORK—Niagara Electrolytic Iron Co. has been incorporated with 15,000 shares $100 par preferred stock, 48,000 shares no par value common, by D. J. Ogilvie, F. X. Coughlan and C. P. Perin, with T. L. Frothingham, 160 Broadway, as attorney.

QUEENS, L. I., N. Y.—Hallock Sales Co. has been incorporated with 100 shares no par value stock to manufacture and sell electrical machinery, by P. D. Ferrall, M. A. Coss, and P. F. W. Ruther, 55 Wall Street, New York, as attorney.

RIDGEWOOD, N. Y.—Crane Co., 836 South Michigan avenue, Chicago, manufacturer of valves, etc., has retained Raymond Hood, 18 East Forty-first street, New York, as architect, for 1-story, 80x272-foot warehouse of brick and concrete construction at Irving avenue, this city.

ROCHESTER, N. Y.—Eastman Kodak Co., George Eastman, 343 State street, president, plans 4-story, 40x60-foot storage and warehouse bulding. Ridge Construction Co., 335 Lewiston avenue, is general contractor.

UTICA, N. Y.—Munson Mill Machinery Co. has awarded contracts to Lyons Bros., Lyons Mills, Solsville, N. Y., for a 1-story foundry for the production of iron and steel castings.

CLEVELAND—Teachout Realty Co., 331 Prospect avenue, has awarded the Austin Co. contract for constructing 1-story warehouse addition at 1487 Kinsman road. Building will be 114x124 feet of brick and composition construction.

GENEVA, O.—Geneva Metal Wheel Co., has awarded general contract to J. H. O'Grody, 2954 Kensington road, Cleveland Heights, O., for 2-story, 30x62-foot cupola house. The general contractor is taking bids on subsidiary contracts and materials.

TOLEDO, O.—The Pennsylvania Railroad Co. has appropriated $500,000 for constructing a 29-stall engine house between East Broadway and Oak street, East Toledo. Total cost will approximate $1,000,000. Considerable equipment probably will be needed for outfitting the new building.

PORTLAND, OREG.—Northwestern Electric Co. is constructing a steel frame building at the Lincoln street steam plant. Full equipment, including two 1000 horsepower boilers are being installed.

PORTLAND, OREG.—Multnomah Block, Inc., will construct a large store and garage building at Nineteenth and Morrison streets. H. F. Corbiett is president. The garage is to be one of the largest in the Northwest. The Austin Co., Cleveland and Portland, has been awarded the contract for constructing the building which is to be a 2-story, mill-type, reinforced concrete plant. The Portland office of the Austin company will handle all purchases.

DUNBAR, PA.—Western Maryland railroad plans rebuilding the locomotive repair shop recently damaged by fire.

FRIE, PA.—Perry Iron Works will construct an artificial gas plant costing approximately $3,000,000. The Pennsylvania Gas Co. will spend about $2,000,000 for additional service.

OAK LANE, PA.—Austin Co., Philadelphia and Cleveland, engineer and builder, will purchase 35 tons of steel for the Oak Lake Country Day School, here.

PHILADELPHIA—Walter Smith, 310 Reed street, is taking bids through the architect, Frank Clark, 23 South Sixteenth street, for a 1-story, 102x128-foot brick garage.

PHILADELPHIA—Philadelphia Boat Co., care of Andrew C. Borzner, 717 Walnut street, architect, is planning 2-story, 40x100-foot addition to plant at 4412 Ridge avenue.

PHILADELPHIA—Hess Bright Mfg. Co., Front and Erie streets, has awarded general contract to H. John Homan, Eighteenth and Cherry streets, for 1-story, 35x140-foot plant addition costing about $50,000.

PHILADELPHIA—William Berger, 513 South Sixtieth street, is taking bids on general contract for a 1-story, 90x110-foot garage and show room of brick and steel at 6031 Larchwood avenue. I. W. Levin, 1011 Chestnut street, is architect.

PHILADELPHIA—Chaitt Bros., Wyneva garage, 152 West Logan street, has awarded contracts to J. T. Phister, 106 West Highland avenue, for 1-story, 114x144-foot garage costing about $60,000, of brick and steel construction. J. K. Hinkels, 105 Highland avenue, is architect.

PITTSBURGH—The Universal Portland Cement Co., Carnegie building, plans purchase of machine tools. C. Miller, Jr., is purchasing agent.

PITTSBURGH—Rosedale Foundry & Machine Co. is reported as contemplating purchase of a heavy duty plain radial drill, keyseater with 16-inch stroke and power hammer.

PITTSBURGH—The Williams Gauge Co., manufacturer of steam columns, gages and steam specialties, has awarded the Austin Co. a contract for design and construction of a machine shop and office building, 60x120 feet, 1-story. The plant is to be completed within 55 days. The Cleveland office of the Austin Co. will handle all purchases and construction. R. M. Williams is president and J. R. Miller plant manger of the Williams Gauge Co.

RUTLAND, VT.—Rutland Railroad Co. plans constructing new boiler plant.

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for Vitreous Enameling

SIGNS
Stove Door Panels: Splasher Backs: Broiler Pans: Table Tops: Refrigerators: and other Flat Work

Wabik Metal Sheets, like all other Mansfield Products, are rolled from our own "Bottom-poured Ingots." They are very low in sulphur.

Other Specialties:

Body Stock; Flat Fender and Hood Stock; Cowl Stock; Radiator Casing Stock; Crown Fender Stock.

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PICKELED and ANNEALED
ENAMELING STOCK
for Kitchen Utensils
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"Mansfield" Steel is the ultimate in Sheet Bars and in Sheets. It means satisfaction to all of the many users. Constant study of the needs of users, and continuous application of the results of such study, in the way of improved methods in our plants has established a reputation for unsurpassed reliability.

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MANSFIELD, OHIO

DISTRICT SALES REPRESENTATIVES

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Mansfield Sheet & Tin Plate Co., 1372 Wrigley Bldg., Chicago, Ill.
Mansfield Sheet & Tin Plate Co., 12-237 General Motors Bldg., Detroit, Mich.
The L. D. Rockwell Co., 2002 Union Trust Bldg., Cleveland, O.
Wm. L. Hoffman, 1504 West Venango St., Philadelphia, Pa.
Mr. C. H. Beach, 617 Merchants Bank Bldg., Indianapolis, Ind.
Mr. A. P. Grenier, 640 Endicott Bldg., St. Paul, Minn.
Wm. P. Horn Co., 237 Rialto Bldg., San Francisco, Cal.
Wm. P. Horn Co., 301 Kerchoff Bldg., Los Angeles, Cal.
Wm. P. Horn Co., Dekum Building, Portland, Ore.
Wm. P. Horn Co., 1426 L. C. Smith Bldg., Seattle, Wash.

Iron and Steel Scrap Prices

CORRECTED TO TUESDAY NOON GROSS TONS DELIVERED TO CONSUMER

Steel Works Scrap

HEAVY MELTING STEEL

Birmingham	12.50 to 13.00
Boston (dealers)	11.50 to 12.00
Buffalo	16.50 to 17.00
Chicago	15.50 to 16.00
Cleveland	15.75 to 16.25
Cincinnati	12.50 to 13.00
Detroit (dealers)	14.00 to 14.50
Eastern Pennsylvania	17.00 to 18.00
New York (dealers)	13.00 to 13.50
Pittsburgh	17.50 to 18.00
St. Louis	15.00 to 15.50
Valleys	18.00 to 18.50
No. 1 railroad steel New York (dealers)	13.50 to 14.00

COMPRESSED SHEETS

Buffalo	15.50 to 16.00
Chicago	12.50 to 13.00
Cleveland	13.25 to 13.75
Detroit (dealers)	11.50 to 12.00
Pittsburgh	16.00 to 16.50
Valleys	15.50 to 16.00

BUNDLED SHEETS

Buffalo	13.50 to 14.00
Cincinnati	9.00 to 9.50
Cleveland	12.00 to 12.25
Detroit	9.50 to 10.00
Eastern Pennsylvania	14.00 to 14.50
Pittsburgh	14.50 to 15.00
St. Louis	8.50 to 9.00
Valleys	13.50 to 14.00

SHEET CLIPPINGS, LOOSE

Chicago	8.00 to 8.50
Detroit	8.50 to 9.00

STEEL RAILS, SHORT

Birmingham	12.50 to 13.00
Detroit	14.50 to 15.00
Chicago	17.50 to 18.00
Cincinnati	16.00 to 16.50
Cleveland (over 6 ft.)	15.00 to 15.50
St. Louis	18.50 to 19.00

STOVE PLATE

Birmingham	14.00 to 15.00
Boston (consumers)	15.00 to 15.50
Buffalo	16.00 to 16.50
Chicago	16.00 to 16.50
Cincinnati (net tons)	10.00 to 10.50
Cleveland	13.25 to 13.50
Detroit (net tons) dealers	13.50 to 14.00
Eastern Pennsylvania	15.50 to 16.00
New York (dealers)	12.00 to 12.50
Pittsburgh	14.00 to 14.50
St. Louis	15.75 to 16.25

LOW PHOSPHORUS

Buffalo	18.50 to 19.00
Cincinnati	14.50 to 15.00
Eastern Pennsylvania	19.50 to 20.50
Pitts. billet and bloom crops	22.00 to 22.50

SHOVELING STEEL

Chicago	15.25 to 15.75
Pittsburgh	14.50 to 15.00
St. Louis	14.50 to 15.00

KNUCKLES, COUPLERS, SPRINGS

Chicago	18.00 to 18.50
Eastern Pennsylvania	19.00 to 20.00
Pittsburgh	20.00 to 20.50
St. Louis	20.00 to 20.50

FROGS, SWITCHES, GUARDS

Chicago	15.50 to 16.00
Eastern Pennsylvania	16.50 to 17.50
St. Louis	16.50 to 17.00

BOILER PLATE, CUT

St. Louis	11.50 to 12.00

ANGLE BARS—STEEL

Chicago	16.50 to 17.00
St. Louis	17.00 to 17.50

Iron Mill Scrap

RAILROAD WROUGHT

Birmingham	$12.00 to 13.00
Boston (dealers)	13.50 to 14.00
Buffalo	15.00 to 15.50
Cleveland, No. 1	12.50 to 13.00
Chicago, No. 1	15.75 to 16.25
Chicago, No. 2	15.50 to 16.00
Cincinnati, No. 1	11.00 to 11.50
Detroit, No. 2	14.00 to 14.50
Eastern Pennsylvania	18.50 to 19.00
New York, No. 1 (dealers)	15.00 to 15.50
Pittsburgh, No. 1	14.50 to 15.00
Pittsburgh, No. 2	17.50 to 18.00
St. Louis, No. 1	13.50 to 14.00
St. Louis, No. 2	14.75 to 15.25

WROUGHT PIPE

Boston (dealers)	11.00 to 11.50
Buffalo	11.00 to 12.00
Eastern Pennsylvania	16.00 to 17.00
New York (dealers)	11.75 to 12.75

YARD WROUGHT

Boston	12.00 to 12.50
Eastern Pennsylvania	17.00 to 18.00

CITY WROUGHT

New York, long	13.50 to 14.00

BUSHELING

Buffalo	14.50 to 15.00
Chicago, No. 1	12.75 to 13.25
Chicago, No. 2	8.50 to 9.00
Cincinnati, No. 1	9.00 to 9.50
Cleveland, No. 1	13.25 to 13.75
Cleveland, No. 2	12.00 to 12.50
Detroit, No. 1	10.50 to 11.00
Detroit, No. 2 (new)	10.50 to 11.00
Detroit, No. 2 (old)	9.00 to 9.50
Eastern Pennsylvania	14.00 to 14.50
Pittsburgh, No. 1.	13.50 to 14.00
St. Louis, No. 1	13.00 to 13.50

MACHINE SHOP TURNINGS

Birmingham	6.00 to 7.00
Boston (dealers)	8.00 to 9.00
Buffalo	12.50 to 13.00
Chicago	9.00 to 9.50
Cincinnati	9.50 to 10.00
Cleveland	13.25 to 13.50
Detroit (dealers)	10.00 to 10.50
Eastern Pennsylvania	14.00 to 14.50
New York (dealers)	9.50 to 10.00
Pittsburgh	14.50 to 15.00
St. Louis	8.00 to 8.50
Valleys	12.50 to 13.00

CAST IRON BORINGS

Birmingham (chemical)	15.00 to 16.00
Birmingham (plain)	7.00 to 8.00
Boston (chemical)	9.00 to 10.00
Boston (dealers)	8.00 to 8.75
Buffalo	12.00 to 12.50
Chicago	10.75 to 11.25
Cincinnati	10.00 to 10.50
Cleveland	13.75 to 14.25
Detroit (dealers)	10.50 to 11.00
Eastern Pennsylvania (chem.)	15.00 to 15.50
Eastern Pennsylvania	14.00 to 15.00
New York (dealers)	9.00 to 9.50
Pittsburgh	14.50 to 15.00
St. Louis	10.25 to 10.75
Valleys	14.50 to 14.75

MIXED BORINGS AND TURNINGS
For blast furnace use

Boston (dealers)	7.00 to 8.00
Cleveland	13.50 to 14.00
Detroit (dealers)	10.50 to 11.00
Eastern Pennsylvania	11.00 to 12.00
New York (dealers)	7.00 to 7.50

IRON AXLES

Birmingham	19.00 to 19.50
Boston (consumers)	31.00 to 32.00
Buffalo	25.00
Chicago	27.50 to 28.00
Cincinnati	19.50 to 20.00
St. Louis	25.50 to 26.00
New York (dealers)	24.00 to 25.00
Eastern Pennsylvania	24.00 to 25.00

IRON RAILS

Buffalo	19.00 to 20.00
Chicago	17.00 to 17.50
Cincinnati	12.50 to 13.00
St. Louis	12.00 to 12.50

PIPES AND FLUES

Chicago	10.50 to 11.00
Cincinnati	9.00 to 9.50
Cleveland	10.50 to 11.00
St. Louis	10.00 to 10.50

RAILROAD GRATE BARS

Buffalo	15.00 to 15.50
Chicago	16.50 to 17.00
Cleveland	13.75 to 14.00
Eastern Pennsylvania	15.00 to 15.50
New York (dealers)	13.00 to 13.50
St. Louis	15.50 to 16.00

FORGE FLASHINGS

Boston (dealers)	8.50 to 9.00
Buffalo	13.00 to 13.50
Chicago	11.00 to 11.50
Cleveland (under 10 in.)	13.50 to 14.00
Cleveland (over 10 in.)	13.50 to 14.00
Detroit (dealers)	9.50 to 10.00

FORGE SCRAP

Boston (dealers)	8.50 to 9.00
Chicago	18.50 to 19.00
Eastern Pennsylvania	14.00 to 14.50

ARCH BARS AND TRANSOMS

Chicago	19.00 to 19.50
St. Louis	19.00 to 19.50

ANGLE BARS—IRON

Chicago	18.00 to 18.50
St. Louis	19.00 to 19.50

Iron and Steel Works Scrap

AXLE TURNINGS

Boston (dealers)	8.00 to 9.00
Buffalo	14.50 to 15.00
Chicago	12.50 to 13.00
Cleveland	14.25 to 14.50
Eastern Pennsylvania	15.00 to 15.50
Pittsburgh	15.50 to 16.00
St. Louis	11.50 to 12.00

STEEL CAR AXLES

Birmingham	17.00 to 18.00
Boston (consumers)	19.00 to 20.00
Buffalo	19.00 to 20.00
Chicago	19.75 to 20.25
Cleveland	17.75 to 18.25
Eastern Pennsylvania	23.00 to 24.00
Pittsburgh	20.00 to 20.50
St. Louis	20.50 to 21.00

SHAFTING

Boston (consumers)	19.00 to 20.00
Chicago	19.50 to 20.00
Eastern Pennsylvania	23.00 to 24.00
New York (dealers)	18.00 to 18.50
St. Louis	19.00 to 19.50

Iron Foundry Scrap

CAR WHEELS

Birmingham, tram car	15.00 to 16.00
Birmingham, iron	14.00 to 15.00
Boston (consumers)	19.00 to 19.50
Buffalo	17.50 to 18.00
Chicago, iron	17.00 to 17.50
Cincinnati	11.50 to 12.00
Eastern Pennsylvania	17.50 to 18.00
New York iron (dealers)	14.50 to 15.00
Pittsburgh, iron	17.00 to 17.50
Pittsburgh, steel	20.00 to 20.50
St. Louis, iron	17.00 to 17.50

NO. 1 CAST SCRAP

Birmingham, cupola	15.00 to 16.00
Boston (consumers)	19.50 to 20.00
Buffalo	17.00 to 17.50
Chicago, No. 1 machinery	19.00 to 19.50
Cincinnati No. 1 machinery cupola (net tons)	17.00 to 17.50
Cleveland, cupola	18.50 to 18.75
Detroit (net tons) (dealers)	15.00 to 15.50
Eastern Pennsylvania, cupola	17.50 to 18.50
New York, cupola (dealers)	14.00 to 14.50
Pittsburgh, cupola	18.00 to 18.50
San Francisco	20.00
Seattle	15.00 to 19.00
St. Louis railroad	19.00 to 19.50
St. Louis, agricultural	19.00 to 19.50
Valleys	19.50 to 20.00

HEAVY CAST

Boston (consumers)	15.50 to 16.00
Buffalo (breakable)	16.00 to 16.50
Cleveland	12.50 to 13.00
Detroit (automobile) (net ton)	15.50 to 16.00
Eastern Pennsylvania	17.00 to 17.50
New York (dealers)	13.00 to 13.50
Pittsburgh	15.00 to 15.50

MALLEABLE

Boston (railroad)	18.00 to 18.50
Buffalo	17.50 to 18.00
Chicago, railroad	17.50 to 18.00
Chicago, agricultural	16.50 to 17.00
Cincinnati, agricultural	12.00 to 12.50
Cincinnati, railroad	14.50 to 15.00
Cleveland, agricultural	16.50 to 16.75
Cleveland, railroad	17.50 to 18.00
Detroit (dealers)	15.50 to 16.00
Eastern Pennsylvania, railroad	15.50 to 16.50
Pittsburgh railroad	16.00 to 16.50
St. Louis, agricultural	13.50 to 14.00
St. Louis, railroad	15.00 to 15.50

Miscellaneous Scrap

RAILS FOR ROLLING
5 feet and over

Birmingham, tram car	15.00 to 15.50
Boston (dealers)	12.00 to 13.50
Chicago	16.00 to 16.50
Cleveland	16.00 to 16.25
Detroit	14.00 to 14.50
Eastern Pennsylvania	18.00 to 18.50
New York (dealers)	15.00 to 15.50
Pittsburgh district	19.00 to 19.50
St. Louis	17.50 to 18.00

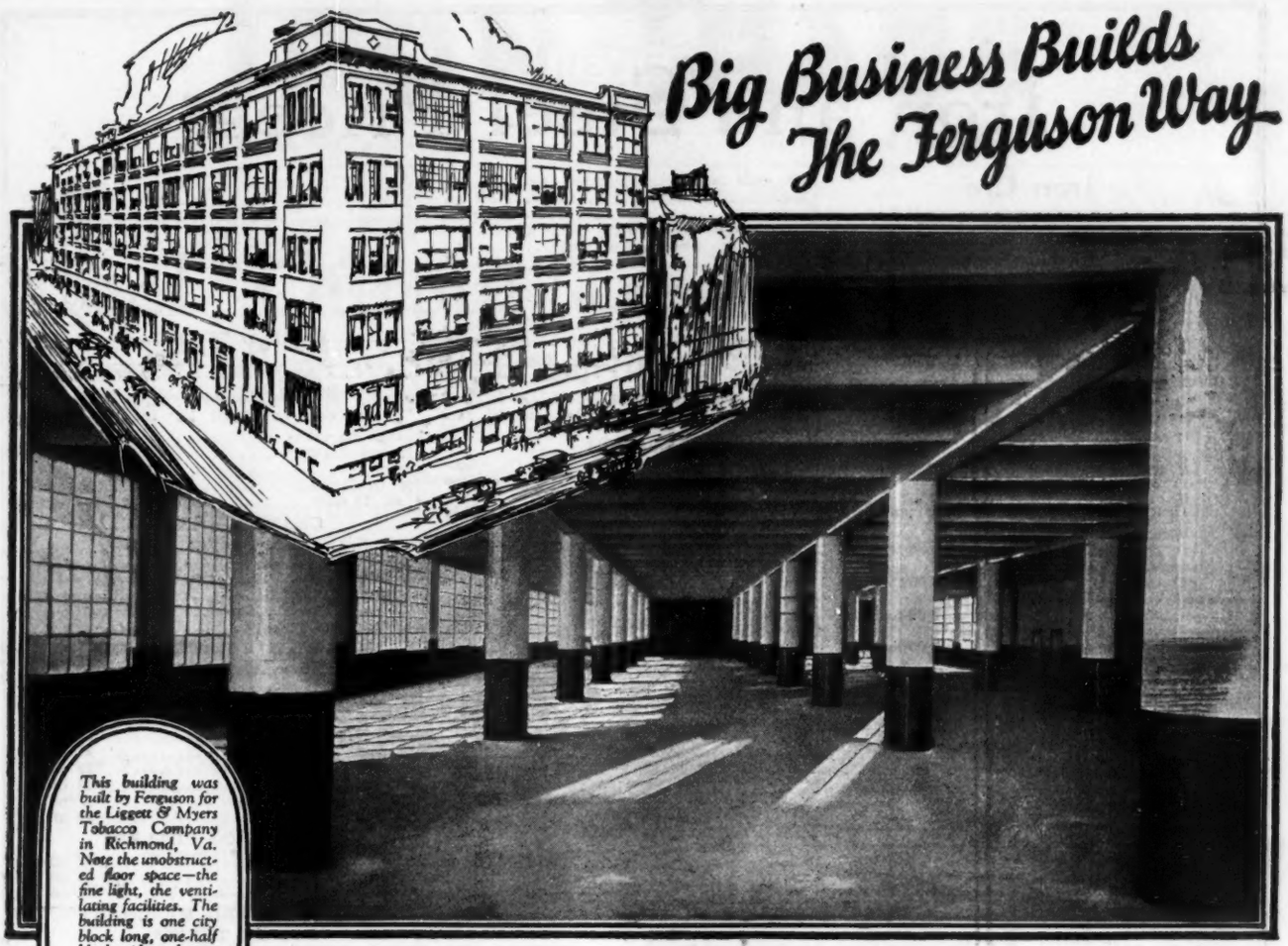
LOCOMOTIVE TIRES

Chicago	18.00 to 18.50
St. Louis	17.00 to 17.50

LOW PHOSPHORUS PUNCHINGS

Chicago	17.00 to 17.50
Eastern Pennsylvania	18.00 to 19.00
Pittsburgh	20.50 to 21.00

Big Business Builds The Ferguson Way



This building was built by Ferguson for the Liggett & Myers Tobacco Company in Richmond, Va. Note the unobstructed floor space—the fine light, the ventilating facilities. The building is one city block long, one-half block wide and consists of five stories and basement. Its equipment is capable of producing 40,000,000 Fatima cigarettes a day.
Architects: Francisco & Jacobus New York City

A few Ferguson users:

National Cash Register Co.
Dayton, O.
Procter & Gamble Co.
Cincinnati, O.
General Electric Company
Schenectady, N.Y.
Cyclone Fence Company
Waukegan, Wis.
David Lupton Sons Co.
Philadelphia, Pa.
Nordyke & Marmon
Indianapolis, Ind.
A. P. W. Paper Company
Albany, N. Y.
Maxwell Motors Company
Detroit, Mich.
Continental Gin Company
Birmingham, Ala.

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They know that Ferguson designs are based on years of practical experience in industrial building. They know that Ferguson backs up both design and construction with a *definite, binding guarantee*—that this guarantee extends also to cost and delivery date.

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They know that whether Ferguson contracts to build a factory in thirty working days or to handle a tremendous two-year undertaking like that now under way in Japan, the work will be exactly as specified *—and will be finished on time.*

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Ferguson
GUARANTEED BUILDINGS

Iron and Steel Prices

Iron Ore

LAKE SUPERIOR ORES

Per Gross Ton Lower Lake Ports

Old range bessemer, 55 per cent iron. $5.65
Mesabi bessemer, 55 per cent iron.... 5.40
Old Range nonbessemer, 51½ per cent iron 4.90
Mesabi nonbessemer, 51½ per cent iron 4.75

EASTERN LOCAL ORES

Cents per unit delivered at Eastern Pennsylvania and New Jersey furnaces

Foundry and basic 53 to 63 per cent ..... 9.00 to 10.00
Copper free low phosphorus 53 to 65 per cent ..... 12.50 to 13.50

FOREIGN IRON ORE

Cents per unit, c.i.f. Atlantic ports

Spanish low phosphorus, 52 to 54 per cent ..... 9.00 to 9.50
Algerian low phosphorus, 52 to 54 per cent ..... 10.00 to 10.50
Swedish and Norwegian low phosphorus, 68 per cent.. 11.00 to 11.50
Swedish foundry or basic, 66 to 68 per cent ..... 9.00 to 10.00
Spanish foundry or basic, 50 to 54 per cent ..... 8.00 to 9.00
Alegerian foundry and basic, 50 to 54 per cent ..... 8.00 to 9.00

Manganese Ore

Prices do not include duty at rate 1 per cent per pound of metallic manganese contained.

Brazilian, minimum 47 per cent....nominal
Indian, minimum 47 per cent.....
....nominal 41 to 42 cents c.i.f. tidewater
Caucasian, 53 to 55 per cent.....
.....Ordinary, 43 cents c.i.f. tidewater
.....Washed, 46 cents c.i.f. tidewater

Fluor Spar

85 and 5 per cent grade

Washed gravel, Kentucky and Illinois mines, per net ton $19.00 to 23.50
Washed gravel, imported duty paid eastern tidewater, per net ton ..... 18.00 to 19.00

Rivets

Structural rivets, C. L. Pitts.. 2.50c to 2.60c
Structural rivets L. C. L. Pittsburgh 2.65c
Rivets, 7/16-in. and smaller.....
.....70 and 10 off to 70, 10 and 10 off

Nuts and Bolts

Hot pressed square or hexagon blank ..... $4.75 off list
Hot pressed square or hexagon tapped ..... 4.75 off list
Cold punched square or hexagon blank ..... 4.75 off list
Cold punched square or hexagon..... 4.75 off list
Cold punched semifinished hexagon nuts ⅜-inch and larger .....80 and 5 off
Cold punched semifinished hexagon nuts 9/16-inch and smaller ....80, 10 and 5 off
Price f.o.b. Pittsburgh, packages of 50.

CARRIAGE BOLTS

(¾ x 6 inches, smaller and shorter)

Rolled thread .....60 and 20 off
Cut thread .....60 and 10 off

MACHINE BOLTS

(⅜ x 4 inches, hot pressed nuts)

Rolled thread .....60, 20 and 10 off
Cut thread .....60 and 20 off

(All sizes cold punched nuts)

Cut thread .....60 off
Lag screws .....70 and 10 off
Plow bolts Nos. 1, 2 and 3 heads.. .....50 and 10 off
4 to 10 heads.....50-10 + 20 off
Flat and round head stove bolts..... .....80,10 and 5 off
Other stove bolts .....80, 10 and 5 off
Tap bolts .....30 off
Bolt ends with hot pressed nuts..... ..... 65 and 10 off
Bolt ends with cold punched nuts.... .....60 off
Blank bolts .....65 and 10 off
Rough stud bolts with nuts (250 pieces or more of a size)..... ....45, 10 and 5 off

Washers

Wrought .....$5.75 to $6.25
Lock washers .....80, 10 and 10 off

Steel Pipe

(Effective April 19, 1923)

Pittsburgh basing discounts, jobbers' carloads.

	Black	Galvanized
Butt Weld		
⅛-inch	45	19½
¼ and ⅜-inch	51	25½
½-inch	56	42½
¾-inch	60	48½
1 to 3-inch	62	50½
Lap Weld		
2-inch	55	43½
2½ to 6-inch	59	47½
7 to 8-inch	56	43½
9 and 10-inch	54	41½
11 and 12-inch	53	40½
REAMED AND DRIFTED		
Butt Weld		
1 to 3-inch	60	48½
Lap Weld		
2-inch	53	41½
2½ to 6-inch	57	45½
EXTRA STRONG—PLAIN ENDS		
Butt Weld		
⅛-inch	41	24½
¼ and ⅜-inch	47	30½
½-inch	53	42½
¾-inch	58	47½
1 to 1½-inch	60	49½
2 to 3-inch	61	50½
Lap Weld		
2-inch	53	42½
2½ to 4-inch	57	46½
4½ to 6-inch	56	45½
7 to 8-inch	52	39½
9 and 10-inch	45	32½
11 and 12-inch	43	31½
DOUBLE EXTRA STRONG		
Butt Weld		
½-inch	42	32½
¾ to 1½-inch	45	35½
2 to 2½-inch	47	37½
Lap Weld		
2-inch	41	32½
2½ to 4-inch	43	34½
4½ to 6-inch	42	33½
7 to 8-inch	38	25½

Wrought Iron Pipe

(Effective Jan. 23, 1923)

Pittsburgh basing discounts, jobbers' carloads

THREADS AND COUPLINGS		
Butt Weld		
¼ and ⅜-inch	+11	+39
½-inch	22	2
¾-inch	28	11
1 to 1½-inch	30	13
Lap Weld		
1¼ and 1½-inch	Upon application	
2-inch	23	7
2½ to 6-inch	26	11
3 to 6-inch	28	13
7 to 12-inch	26	11
PLUGGED AND REAMED		
Two points less than above		
EXTRA STRONG, PLAIN ENDS		
Butt Weld		
¼ and ⅜-inch	+19	+54
½-inch	21	7
¾-inch	28	12
1 to 1½-inch	30	14
Lap Weld		
2-inch	23	9
2½ to 4-inch	29	15
4½ to 6-inch	28	14
7 to 8-inch	21	7
9 to 12-inch	16	2
DOUBLE EXTRA STRONG		
Butt Weld		
½-inch	+47½	+59½
¾-inch	+28	+40
1-inch	+34	+46
1¼-inch	+28	+40
1½-inch	+27	+39
Lap Weld		
2 and 2½ inches	+13	+25
3 to 4-inch	+ 8	+17
4½ to 6-inch	+ 9	+18
8-inch	+12	

Boiler Tubes

L. C. L. discounts. C. L. 4 points larger

STEEL (Lap Welded)

(Effective April 19, 1923)

2 and 2¼-inch ..... 23 off
2½ and 2¾-inch ..... 33 off
3-inch ..... 36 off
3¼ to 3¾-inch .....38½ off
4 to 13-inch ..... 42 off

CHARCOAL IRON

(Effective April 12, 1923)

1½-inch ..... +22
1¾-inch ..... +12
2 and 2¼-inch..... + 2
2½ to 3-inch 3
3¼ to 4½-inch..... 5

SEAMLESS COLD DRAWN*

(Effective April 19, 1923)

1-inch ..... 51 off
1¼ and 1½-inch ..... 43 off
1¾-inch ..... 27 off
2 and 2¼-inch ..... 18 off
2½ and 2¾-inch..... 28 off
3 and 3¼-inch ..... 32 off
3½ and 3¾-inch ..... 33 off
4-inch ..... 37 off
4½ and 5-inch..... 29 off

SEAMLESS HOT ROLLED*

3 and 3¼-inch ..... 34 off
3½ and 3¾-inch..... 35 off
4-inch ..... 39 off

SEAMLESS STEEL MERCHANT BOILER TUBES*

Extras:

Add $8 per net ton for more than four gages heavier than standard and add 10 per cent to theoretical weight.

Add 5 per cent for lengths over 24 feet and not over 26 feet.

Smaller tubes than 1-inch and lighter than standard gage to be sold at mechanical tubing list and discount.

Intermediate sizes and gages not listed above take price of next larger outside diameter and heavier gage.

SEAMLESS STEEL MECHANICAL TUBING*

Base Discounts

Carbon, 0.10 to 0.20 per cent..... 83 off
Carbon, 0.30 to 0.40 per cent..... 81 off
Carbon 0.40 to 0.50 per cent.....net price

Plus differentials and extras for cutting.

SEAMLESS STEEL LOCOMOTIVE AND SUPERHEATER TUBES*

(Effective April 19, 1923)

Outside diameter	Net prices per foot f.o.b. Pittsburgh Gage	Price
2-inch	12-gage	15c
2-inch	12-gage	15c
2-inch	11-gage	16c
2-inch	10-gage	17c
2¼-inch	12-gage	17c
2¼-inch	11-gage	18c
2¼-inch	10-gage	20c
3-inch	7-gage	35c
1½-inch	9-gage	15c
5½-inch	9-gage	55c
5½-inch	9-gage	57c

Plus usual extras for forming and for long lengths.

*Published discounts are subject to considerable shading, in some cases as much as three extra 5 per cents.

Hot Rolled Alloy Steels

Prices per pound, Pittsburgh

S. A. E. Series—

2300 (3½ per cent nickel)... 5.00c
3100 (nickel chromium)..... 4.00c
6100 (chrome vanadium) 4.75c
6100 (chrome vanadium spring) 4.50c
9250 (Silico manganese spring) 4.00c to 4.25c